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An Address
ON
ASTHMA.

Delivered before the Chichester and Worthing Division of the British Medical Association on Feb. 16th, 1921,

BY ARTHUR F. HURST, M.A., M.D. OXON., F.R.C.P. LOND.,
PHYSICIAN AND NEUROLOGIST TO GUY'S HOSPITAL.

LIKE Sir John Floyer, who published the first book in the English language on asthma in 1698, I myself suffer from asthma, so I have the advantage, which few writers on the subject possess, of 27 years of observation on my own corpus vile. The subject is one of special interest at present, as recent research in England, America, and France, has led to the explanation of many problems connected with asthma which had previously been obscure.

DEFINITION.

I would define asthma as the reaction of an over-excitable bronchial centre to blood-borne irritants and to peripheral and psychical stimuli. One part of the vagal nucleus in the medulla controls the activity of the bronchi. Normally it is in a certain degree of tonic activity. When over-active the broncho-motor fibres of the vagus cause the bronchioles to contract and the broncho-secretory fibres cause the secretion of bronchial mucus to be excessive. This general over-activity is associated with congestion of the bronchial mucous membrane, analogous to what occurs in all other organs when in a condition of functional activity. The engorged mucous membrane adds to the bronchial obstruction caused by the spasm of the circular muscle fibres, and consequently the mucus cannot be easily expelled. It is retained so long that it undergoes a process of coagulation, similar to the change which occurs in the formation of fibrin from fibrinogen, this being due to the activity of a ferment, mucinase, which is present in the bronchial mucous membrane. As the coagulated mucous casts of the bronchioles are slowly expelled along the spiral bronchi they assume the characteristic features of the spiral mucous filaments described by Curschmann, of Leipzig, in 1883. An exactly similar process occurs in the bowel in mucomembranous colitis; mucus is secreted in excess, and owing to the associated spasm it is retained abnormally long, so that there is time for the characteristic membrane to form as a result of the action of the mucinase of the intestinal mucous membrane.

ASTHMA AND ANAPHYLAXIS.

Our knowledge of the blood-borne irritants of the bronchial centre is of recent origin, and my own interest in the subject was stimulated by a visit to America in the summer of 1919. Much important work on the subject has been carried out by Freeman,[1] of St. Mary's, and Walker,[2] of Harvard, work which has thrown light on the hitherto inexplicable individual variations in the ætiology of asthma.* The irritant is generally, but not always, a protein to which the individual is abnormally sensitive. The nature of these toxic idiopathies, as they have been called by Freeman, is obscure, but they present many analogies to experimental anaphylaxis, and it appears probable that they are really examples of anaphylaxis occurring in man owing to inherited or acquired sensitiveness to certain proteins. In guinea-pigs bronchial spasm is one of the characteristic phenomena of anaphylaxis. Whether a man who is sensitive to a certain protein will be unaffected by exposure to a moderate dose of it, or whether he will develop asthma, an urticarial or eczematous rash, or an acute gastro-intestinal attack, depends upon whether he has an irritable bronchial centre, an irritable skin, or an irritable digestive tract.

Walker found that in 52 per cent. of 400 cases of asthma the patient was specifically sensitive to one or more of his available proteins, as shown by the cutaneous tests, and that desensitisation generally prevented the development of asthma, whereas subcutaneous injection of the specific protein produced an attack of asthma. I believe that a still larger proportion of patients would give a positive reaction if they were tested whilst actually asthmatic, as the degree of sensibility varies with the state of the patient's general health, and he may fail to react to proteins during a period of freedom from attacks, although the same proteins may produce well-marked reactions during an asthmatic period.

The protein may gain access to the body by inhalation in the case of pollen, emanations from the hair and skin of animals, and the dust of cereal grains; it is ingested in the case of a great variety of foods; and, lastly, the protein may be derived from bacteria which have formed a focus of infection in the bronchi or less frequently the tonsils, nose, teeth, or intestines. The anaphylactic factor is most common in cases beginning in early life: thus 80 per cent. of those beginning in the first 2 years of life, 65 per cent. from 2 to 15, 50 per cent. from 15 to 35, 25 per cent. from 35 to 50, and none beginning after 50 were of this type (Walker). The special liability in children is most marked with food proteins, and next with animal proteins; the liability to bacterial proteins is equally distributed whatever is the age of onset up to 40.

Food.

Goodale[3] in 1916 showed that extracts of wheat foods gave positive skin reactions in asthmatics who had attacks of asthma when they ate bread. Walker has more recently investigated the question in connexion with a great variety of foods. In 68 out of his 400 cases the patient was sensitive to food protein. In more than half of them (35) the protein was derived from cereals, in most instances wheat (25), but occasionally maize (6), rice (3), rye (2), barley or oats, and sometimes from several sources in the same individual. Maize, oat, rye, and barley rarely caused symptoms before the war, as until the introduction of war bread few people ate enough of them to have any effect. Wodehouse has shown that different individuals are sensitive to different wheat proteins. In most cases the natural proteose of wheat is the most active and differs from the proteose produced artificially from the gluten of wheat. Heating, except to very high temperatures, does not affect the anaphylactogenic properties of wheat proteins.

Next to cereals come eggs among the foods which may cause asthma, and then potato, casein, and fish, especially lobster, oyster, salmon, mackerel, cod, and haddock. The proteins of beef, chicken, and other forms of meat, spinach and other vegetables, strawberries and other fruit are occasionally active, but generally in association with other food proteins. There are, indeed, few if any foods to which some individuals are not sensitive.

Only a small proportion of patients discover for themselves that the particular article of diet to which they are shown to be sensitive by the skin reaction gives them asthma, and in some cases eczema and urticaria as well. They have sometimes, however, a distaste for the food to which they are sensitive, especially in the case of eggs.

Pollen.

Freeman has found as the result of the long series of investigations on hay fever he has carried out during the last ten years that, although a patient suffering from hay fever or hay asthma may be

* Frank Coke's important investigations on the subject were published some weeks after the delivery of this lecture. Brit. Med. Jour., March 12th, 1921.

shown experimentally to be sensitive to a variety of pollens, grass pollen is the only one of any importance in England. It is always present in the air during the grass-flowering season, from the middle of May to the beginning of August, except when recent rain has washed it away. It alone of English pollens is produced in sufficient amount, is sufficiently easily disseminated by light wind, and is capable of producing a strong reaction. Daisy pollen, for example, only flies a few yards in contrast to grass pollen which can fly many miles, and trees only pollinate for a few days instead of for several weeks. In America conditions are very different, and Walker has shown the need for investigating the sensitiveness of each patient to a large variety of pollens. The majority of cases of hay asthma are associated with hay fever, which occurs, of course, still more frequently as an independent condition.

Animal Emanations.

Hyde Salter[4] was the first to recognise that asthma may be caused by the emanation from animals. In 1859 he noted cases of asthma brought on by the presence of cats, horses, guinea-pigs, rabbits, hares, cattle, sheep, and deer. Cat and horse asthma are the most common, the others being comparatively rare. Many patients are at once aware of the presence of a cat in the room from the development of asthmatic symptoms, which are sometimes associated with nasal catarrh and even urticaria. Trousseau described a case of a woman who had an attack of asthma directly her feather-bed was shaken in her presence, and Salter had a patient who could not sleep upon a pillow stuffed with feathers. Freeman writes of a patient who said, "You must put your head on the pillow as upon a wasp's nest." Goodale in 1916 found that an alcoholic extract of the hair of cats produced a skin reaction in patients suffering from cat asthma, the reaction apparently indicating that the individual was anaphylactic to the proteins contained in the extract. Wodehouse[5] found that the substance in the hair of cats and other animals which gave rise to the reaction was not the keratin, which forms the main constituent of hair, nor the proteins of their blood, but various other proteins which he isolated from the dandruff of the animal's skin. Freeman has shown that a slighter reaction is also produced by the flesh, serum, fæces, and nasal mucus in individuals who are sensitive to the dandruff, and that sensitiveness to a horse is associated with a lesser degree of sensitiveness to other members of the horse-tribe, such as the zebra, but to a very slight extent, as a rule, to the donkey.

The quantity of specific protein required to cause an attack of asthma is, of course, exceedingly minute. The comparatively large quantity of foreign protein introduced into the circulation when horse serum is used therapeutically is sufficient to produce an attack in many asthmatics who are not otherwise liable to horse asthma. Anti-diphtheritic or other serum ought, therefore, never to be given to an asthmatic without preliminary desensitisation. In the absence of this precaution death from anaphylactic shock has occurred in a number of cases described by Collier, of Oxford, and others.

Bacterial Toxins.

It has long been recognised that asthma may be associated with infection of the bronchi, and less commonly of the teeth, nasal mucous membrane, tonsils, and intestines. The infection may give rise to the production of bacterial proteins to which the individual is abnormally sensitive, in which case the asthma is of anaphylactic origin, or the lesion produced may act as an irritant focus and give rise to reflex attacks of asthma. It is possible to distinguish between these two possibilities by testing the cutaneous reaction to the toxins of each organism isolated from the sputum or other infective material or to stock toxins obtained from various organisms; a positive reaction is obtained in the anaphylactic but not in the reflex cases. Vaccination may lead to improvement in both classes, but this is likely to be more marked in the former. Dr. John Eyre tells me that the organism which most frequently has a specific relation with asthma is a bacillus of the Friedländer group; this is often found in the spirals coughed up during an attack.

Other Proteins.

Asthmatics are occasionally sensitive to other proteins as well as those already referred to. Thus in one of Walker's patients an attack was always produced in the presence of a flax-seed poultice, and in another the attacks were caused by tobacco smoke, as in a case described by Floyer in 1726. The patients were found by the skin reaction to be sensitive to a protein in flax-seed and tobacco respectively. In a third case a jewel polisher was found to be sensitive to protein obtained from the dust of the boxwood he used in his work. Sensitisation of this kind undoubtedly explains many of the remarkable idiosyncrasies shown by asthmatics.

Multiple Sensitisation.

Walker found that multiple sensitisation was uncommon in cases which begin later than the age of 10, but it is common if it begins in infancy. It is probable that sensitisation to one protein early in life tends to be followed by subsequent sensitisation to others. Skin reactions indicating multiple sensitisation do not necessarily indicate that the asthma is at the actual moment being produced by all the proteins, although each is a potential cause and requires separate consideration in determining what treatment should be undertaken.

REFLEX CAUSES.

The most important peripheral stimuli which may affect an irritable bronchial centre and produce asthma reflexly arise in the nose, bronchi, stomach, and bowel. There is a point on the mucous membrane of the nasal septum opposite the inferior turbinal which appears to be specially rich in afferent nerve fibres which may influence the bronchial centre. Touching this with a probe may cause an asthmatic patient to wheeze, and contact with a congested inferior turbinal may give rise to an attack of asthma. Congestion of the turbinal is most frequently caused by infection, but apart from this contact may occur in individuals with a narrow nose or deflected septum, especially when the turbinal swells as a result of gravity on assuming the horizontal position, this being one reason why sleep is much less likely to be interrupted by an attack of asthma if the patient sits in a chair instead of going to bed.

I have already pointed out that the association of bronchial infection with asthma is due to either or both of two factors—sensitiveness to the toxin of one or more of the infecting organisms, and a reflex caused by the irritation of the bronchial mucous membrane by the infection; the latter must be present alone when the cutaneous reactions are absent, but improvement results from vaccination. Distension of the stomach with food may cause asthma, especially in the evening, quite independently of the nature of the food. Similarly distension of the rectum with fæces produces reflex asthma in patients with an irritable bronchial centre immediate relief follows defæcation.

HYSTERICAL AND EMOTIONAL ASTHMA.

In an individual with an irritable bronchial centre, but never apart from this, asthma may be caused by an idea or an emotion. Thus if a patient has had an attack under certain conditions he will expect to have another if the conditions are repeated. When for any reason the conditions have altered, but without the patient's knowledge, he may yet be so convinced that an attack will occur that one

is produced. Asthma caused by auto-suggestion in this way is truly hysterical, though in the absence of an abnormal bronchial centre no amount of suggestion could cause bronchial spasm and hypersecretion. Trousseau describes the case of a lady, who always had asthma in the presence of roses and had an attack when she saw some artificial roses which she thought were real. On my first visit to Salisbury in 1908 I had a very severe attack, which was repeated the following year, but I had no further attacks on numerous occasions in 1918 and 1919 when I revisited the city, as I had meanwhile become firmly convinced that my second attack was brought on solely by expectation, whatever may have been the cause of the first. Many patients who learn to rely on certain remedies are sure to become asthmatic if they discover that they have forgotten to take their powder, inhalation, or injection with them. Some asthmatics have an attack with any little excitement, business worry, or annoyance, but a severe fright is more likely to stop an attack than to cause one.

THE SUPRARENALS IN ASTHMA.

The excitability of different nerve centres shows considerable individual variations. This is shown by the variability of the pupil reflexes, skin reflexes, and deep reflexes. I believe that asthma is due to a condition which is generally, or perhaps always, inborn, and often inherited, in which the broncho-motor part of the vagus nucleus is more active than in the average man. In some cases it is very slightly so; the individual may then never have an attack of asthma in his life or, as in several of my patients, only a few attacks under very special circumstances. In other cases it is very hypersensitive and the asthma is more severe and constant. The over-activity of the broncho-constrictor fibres of the vagus is kept in check by the broncho-dilator activity of the sympathetic nerve-supply to the bronchial muscles, which is largely dependent on the constant secretion of adrenalin.

Physical and mental fatigue is a very common cause of asthma. Many asthmatics are always ill when they over-work, but recover at once on a holiday. Asthma is always worse in the evening than in the morning, and many patients can eat a large breakfast without any unpleasant symptoms resulting; but the smallest dinner, consisting perhaps of no articles of diet which cannot be taken with impunity at breakfast, is followed at once by wheeziness. And even if no food is eaten at night asthma may develop, though less severely. If the patient sleeps in the afternoon he is often less asthmatic in the evening, or if he sleeps just before dinner he may be able to eat much more than would otherwise have been possible. As asthma is caused by over-activity of the bronchial muscles, it might have been expected that fatigue would result in their relaxation, and consequently in the relief of the asthma. But physical fatigue does not seem to influence involuntary muscles, and certainly it does not lead to the relaxation of the bronchial spasm. It is well known that extreme fatigue leads to marked exhaustion changes in the suprarenal gland. It is quite possible that the fatigue of each day is sufficient to cause a slighter degree of similar changes. The smallest diminution in the secretion of adrenalin would allow the over-activity of the vagal broncho-motor centre to have greater play and asthma would result. These considerations appear to afford an adequate explanation of the production of asthma by fatigue.

A toxic idiopathy or hypersensitiveness to a certain protein, according to certain French authors, depends in part upon the fact that the protein has the effect of depressing the activity of the suprarenals. This effect may manifest itself in depression of one or all of its normal activities, the chief being in connexion with the blood-vessels, the alimentary canal, and the bronchi. Acute and severe anaphylaxis produced by large doses of serum injected into an individual sensitised by a previous injection of serum affects all three. More commonly only those functions in which the adrenal control is specially important for the particular individual are affected. Thus an asthmatic will have an attack of asthma and a man with a sensitive vaso-motor system will develop urticaria or other vaso-motor disturbances in the skin. A man who tends to have gastro-intestinal attacks owing to the abnormal irritability of his digestive tract will vomit and have diarrhœa and abdominal cramp owing to exaggerated peristalsis and relaxation of the cardiac, pyloric, and ileo-cæcal sphincters; this explains idiosyncrasies to shell-fish, eggs, and other foods which are manifested by acute digestive disturbances. In some cases an attack of asthma will be accompanied by the vaso-motor changes, or alternate with them, or will be accompanied by the abdominal attack. In one of my patients an attack of diarrhœa is always preceded by a feeling of tightness in the chest, which may develop into definite asthma whilst the diarrhœa lasts, finally disappearing with it. Lastly, in some cases the idiopathy is manifested in an attack of hay fever.

It is a familiar fact that a severe fright may relieve an attack of asthma. A man in the middle of a severe attack was driving downhill when the brake refused to act; he was in immediate danger of dashing into a wall which faced him at the bottom of the hill, but at the very last moment he succeeded in regaining control of the car; when he drew up he found that he was breathing with perfect freedom. This was probably due to the stimulation of the sympathetic and of adrenalin secretion caused by the fright. The stimulation of suprarenal secretion by asphyxia, which is perhaps the cause of second wind in runners, explains also the spontaneous relief or "second wind" which an asthmatic may experience if he continues his exercise after walking has brought on a moderate degree of dyspnœa. Finally, the extraordinarily rapid effect of adrenalin injections in bringing relief to an acute attack of asthma in many individuals can best be explained by this theory. The dose required is less than that required to produce general symptoms, such as a rise of blood pressure and a rapid pulse, because adrenalin first acts upon any organ which is too much under vagal control at the moment. If any intestinal symptoms are present these are likely to be relieved at the same time.

INHERITANCE OF ASTHMA.

All writers have noted the frequency of a family history of the disease in asthmatics, a frequency which is much too great to be accidental. Thus in 39 per cent. of Salter's 217 cases there was a clear history of inheritance. The important question arises: What is it that is inherited? I think that there is sufficient evidence to prove that it is sometimes an irritable bronchial centre, sometimes a toxic idiopathy, and sometimes both. When an individual whose father or mother is asthmatic develops asthma in the absence of any evidence of a toxic idiopathy, or has his first attack of asthma as a sequel of an infection or after he has acquired in adult life a toxic idiopathy, he must have inherited an irritable bronchial centre. For there is no doubt that a toxic idiopathy may be acquired, especially as a result of prolonged exposure to emanations in the course of a man's occupation. In half of Walker's cases which began after the age of 50 the patient was sensitive to a protein with which he came in contact as a result of his work: thus several bakers were sensitive to wheat, an ostler to horse dandruff, and a coffee-sifter to the protein of green coffee husks. Trousseau described the case of a chemist who had a violent attack of asthma when linseed, scammony, and ipecacuanha were powdered in his laboratory, and four others who were sensitive to ipecacuanha only. If no toxic idiopathy is inherited or acquired in an individual who is a potential asthmatic as a result of having inherited a sensitive bronchial centre, he may transmit the tendency to

his children without ever developing asthma himself. Thus the paternal grandfather and uncle and maternal grandmother and aunt but neither parent of one of my asthmatic patients suffered from asthma.

An individual may share with some of his relations an abnormal sensitiveness to a certain protein. Coke relates the cases of a woman who was sensitive to milk, and had severe asthma throughout her two pregnancies; both children were fed on cow's milk; the first had gastric symptoms for the first 6 weeks of its life, and the second died from asthma when 6 weeks old. More frequently a general tendency to toxic idiopathies is inherited; Freeman has published numerous instances of this. This may manifest itself in different members of the family as asthma, hay fever, or digestive disturbances, depending upon the inheritance or acquisition of an irritable bronchial, nasal, or digestive system respectively.

TREATMENT.

Three things require consideration in discussing the treatment of asthma: (1) the irritable bronchial centre; (2) the chemical, reflex, and psychical stimuli which may affect the centre; and (3) the attack itself.

1. *The Irritable Bronchial Centre.*

Every asthmatic knows that the better his general health is the less liable he is to asthma. In other words, the irritability of his bronchial centre varies directly with the state of his health. For this reason he should avoid over-work and take adequate holidays. Nothing is likely to do him more good than a month in the Swiss mountains in the winter, where he will probably find that he can indulge in ski-ing, lugeing, and skating with a vigour and freedom from respiratory distress he has not known for months. He should try to take some exercise every day, and a great deal more during the week-end. Slight dyspnœa is no contra-indication, as it often disappears on persevering with the exercise. Most important of all, he should try his best to avoid all possible causes of asthma, as the longer he remains free from it the less irritable the centre will become, until finally after some years of inactivity it may cease to respond at all to stimuli which in the past invariably gave rise to attacks. The best cure of asthma is not to have it. It is almost always possible to find some place where the patient does not get asthma, and no asthmatic child should be allowed to go to a school where he is more or less constantly asthmatic.

I have found that the irritability of the bronchial centre can be to some extent reduced by giving between 3 and 5 grains of caffeine, with double the dose of phenazone, when the patient feels slightly asthmatic and fears that an attack will develop later, as, for instance, immediately after lunch and dinner or on going to bed.

2. *Chemical, Reflex, and Psychical Stimuli.*

(*a*) *Toxic idiopathies.*—When asthmatic attacks are caused by food proteins all that is generally necessary is to exclude from the diet the food to which the patient is found to be most sensitive by the cutaneous test. Long abstention probably results in desensitisation. If eczema or urticaria is present it often disappears at the same time. Desensitisation does not follow injection of the proteins or feeding in slowly increased quantities of the food. Desensitisation to pollen can almost invariably be brought about by the subcutaneous injections of progressively larger doses of the pollen extract during the weeks preceding each hay-fever and hay-asthma season.

A patient can often free himself from asthma by simply avoiding any animal to which he has been shown to be sensitive, or in the case of feathers by avoiding feather pillows, mattresses, and upholstery. When an asthmatic is sensitive to horse dandruff in a dilution of 1 in 10,000 or more desensitisation is necessary, as the dust of city streets contains sufficient of the protein to cause attacks. In such cases, and whenever avoidance of the animals is impossible or does not relieve the asthma, desensitisation should be undertaken with the specific proteins. Nothing but specific treatment is of any use; thus an individual who is sensitive to horse serum can be desensitised with the serum if it is necessary to give him some antitoxin, but this has no effect on his asthma, even if he happens to be also sensitive to horse-dandruff proteins. A large proportion of cases are relieved; at the same time the skin reaction disappears or is greatly reduced in intensity.

Idiopathy to bacterial toxins can generally be overcome by vaccination in the ordinary way with organisms isolated from the patient's bronchial secretion or material obtained from other infective foci. In determining which organisms are most important the cutaneous reactions give some help, but even if no reaction is obtained an autogenous vaccine may prove very useful in curing chronic bronchitis or rhinitis which has acted as a reflex cause of asthma. The reaction is generally negligible if the injection is made at night and the patient takes 10 or 15 grains of aspirin at the same time. Lastly, the daily life of each patient should be investigated in every detail in an attempt to find some special toxic idiopathy other than the familiar ones already described, which may be in part responsible for the asthma.

(*b*) *Reflex causes.*—Bronchitis should be treated by autogenous vaccines and small doses of iodide taken for long periods. A careful examination of the nose should be made and any obvious source of irritation should be removed, but no operation should be performed unless it is very clearly indicated, as I have seen several cases aggravated by such operations, and one of the worst cases I ever saw was a man of 50 who had his first attack of asthma immediately after a hypertrophied turbinal had been removed. I have seen several cases in which mere cauterisation of a sensitive point on the septum in an apparently normal nose, as advocated by Francis, has produced marked improvement, though rarely, if ever, complete disappearance of all attacks. In many cases an autogenous vaccine prepared from the nasal secretion will do away with the need for local treatment by relieving the congestion which is secondary to infection, and in any case it is a useful preliminary measure in order to diminish the severe reaction which occasionally follows an operation. Apart from the Friedländer bacillus, already referred to, Dr. Eyre finds that the *B. septus* isolated from the nasal secretion, and pneumococci, *M. catarrhalis* and streptococci from the nasal and bronchial secretion are the organisms most frequently found in the rhinitis and bronchitis associated with asthma.

Asthma caused by a gastro-bronchial reflex can be avoided by eating hardly anything for dinner, which should be as early as possible, and nothing at all on going to bed, as the reflex only comes into play as the day advances and the patient becomes more tired. I have already pointed out how much benefit he may derive by sleeping or resting for half an hour before his evening meal. Regulation of the quantity of food is of more importance than its quality, except for any toxic idiopathies which may be present, but the food, especially in the evening, should be as digestible as possible; no better guide to a suitable diet could be found than that given in Dr. James Adam's little book on "Asthma."

The intestinal-bronchial reflex comes almost entirely from the pelvic colon and rectum, and regular habits and exercises to overcome dyschezia are generally sufficient to keep it in check. Aperients should be avoided as far as possible, but in some cases a small weekly dose of infusion of senna is needed to prevent a fæcal accumulation from forming.

(*c*) *Psychical causes.*—Psychotherapy is only useful in so far as explanation of the mechanism involved may lead an asthmatic to take a less hopeless view

as to his chance of complete recovery. So long as he feels convinced that certain circumstances will inevitably cause an attack they will certainly do so. He should be persuaded to be optimistic about his condition, and hope and even expect that what has hitherto caused an attack will not necessarily do so in the future.

3. *The Attack.*

An attack of asthma can most readily be cut short by the subcutaneous injection of adrenalin. The most efficacious dose is very much smaller than that generally given. In many cases a single minim of 1 in 1000 adrenalin chloride is enough, more than two minims being rarely required. But the injection should be given at the beginning of an attack, directly a patient wakes in the night, for instance, and not half an hour or an hour later when it has reached its full development. The relief is so immediate that the patient often falls asleep within five minutes of waking in an attack. Such small doses give rise to no unpleasant sensations, such as frequently follow the injection of three or more minims, and the blood pressure does not rise at all. Consequently the treatment can be continued for long periods without any fear of ultimately causing arterio-sclerosis. It is the only form of injection which a patient should be allowed to use on himself; if he has to depend on someone else giving the injection he will rarely receive it at the right moment.

For slight attacks and for the feeling of slight dyspnœa, which may persist throughout the day when severe attacks occur at night, atropine and cocaine may be used with an atomiser.

No patient should be allowed to use any of the numerous powders which are used by inhaling the fumes produced when they are burnt, as they invariably aggravate any bronchitis which may be present, and actually give rise to bronchitis in patients who have hitherto been free from it. I have seen several patients who have only recovered from a prolonged attack of asthma, persisting for weeks or months, after they had been persuaded to spend their nights sleeping in an easy chair instead of lying down in bed. Lastly, I wish to emphasise the fact that these remarks on the treatment of the attack should not make us forget that our chief aim must be to devise such a course of action for the patient that he will eventually have no attacks to treat.

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ST. BARTHOLOMEW'S HOSPITAL: TREASURER'S REPORT.—This report, dealing with the year 1920, opens with a statement regarding the policy of asking payment from both in-patients and out-patients, that policy being in accord with the principles laid down by King Edward's Hospital Fund for London. A review of the causes of the increased expenditure of the hospital and the means which have been adopted to meet it afford instructive information on hospital management generally, and is worthy of attentive perusal. During the year under notice 8404 in-patients were admitted, making, with the 567 patients who were under treatment on Jan. 1st, 1920, a total of 8971. The casualty patients (first attendance) were: medical, 30,385; surgical, 38,219. Street accident and illness cases brought to the hospital by ambulances or hand litters belonging to the Corporation of the City of London or to the County Council numbered 2203. The statistics dealing with the treatment of discharged sailors and soldiers show that 334 pensioners were admitted into the wards, the total attendance for out-patient treatment being 26,048.

A Lecture
ON
MITRAL STENOSIS.

Delivered at the National Hospital for Diseases of the Heart,

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OF the several varieties of heart disease which are valvular in origin mitral stenosis will, at all times, occupy an important and prominent position; it is an example of the progressive maladies which sooner or later in their course evince signs and symptoms of myocardial incompetence in association with some existing valvular defect; moreover, mitral stenosis occupies a position of relatively high importance, being a condition of extreme prevalence, and also for the reason that definite clinical indications invariably exist which inform us of the progress of the disease and provide all the evidence needed for accuracy in prognosis and success in treatment.

Mitral stenosis may be broadly defined as a type of those diseases which are somewhat slow to proclaim their presence with certainty; this is easily understood, for the narrowing of the valve can only be produced by gradual stages, and the cicatrising process, however originated, must inevitably proceed slowly. As regards sex-incidence, all authorities are agreed in finding this disease more common in the female than the male, probably owing to the fact that rheumatism and chorea, the two conditions which undoubtedly originate endocarditis in the majority of cases, are more prevalent in the female. The disease is essentially one of early adult life, statistics all going to prove the extreme frequency of the condition between the ages of 20 and 35 years.

ÆTIOLOGY.

The ætiological factors may be discussed under two headings: (1) acute infections; (2) degenerative processes. A third group may perhaps be mentioned to include rare types of the disease due to strain, trauma, congenital malformation, &c.; these need not detain us. Of the acute infections which initiate early changes in the tissues of the valve and its adjoining structures, the rheumatic group of diseases predominates in overwhelming fashion; but measles, scarlet fever, small-pox, erysipelas, pneumonia, septicæmia, &c., account for a considerable number of cases.

Group (2) comprises the types of the disease which are secondary to degenerative processes; retrograde changes which take place with advancing years, whether they be secondary to some form of toxæmia, long-continued strain, or other causes, may be responsible for valvular disturbance and disease; hence the association between degenerative processes characterising such diseases as gout, syphilis, chronic nephritis, plumbism, arterio-sclerosis, &c., and valvular lesions, in which fibrotic changes, adhesions, retractions, and other such-like malformations are gradually produced; it should, however, be remarked in passing that all the evidence at our disposal points to the factors mentioned in Group (1)—viz., acute infections, materially outweighing degenerative lesions in relative importance, so that, for practical purposes, we may regard mitral stenosis as a disease caused by the chronic inflammatory process following endocarditis which leads, sooner or later, to thickening and fusion of the valvular cusps.

The first manifest result of the stenosis will clearly be centred round the obstruction, which interferes with the even blood flow from the left auricle above to the ventricle below, and the influence it exerts upon the cardiac mechanism and output; in the

early stages of the disease it is evident that the heart's main difficulty will be adequately to maintain the filling of the left ventricle, to which the inflow will be slowed by the lesion; a disturbance will therefore arise in the relative pressures, venous and arterial—pressure in the left auricle and pulmonary veins being raised at the same time as the amplitude and force of pulse diminishes in the aorta and its branches; this dislocation of the normally balanced pressures evokes rapid response on the part of the cardiac musculature, which utilises its reserve of energy by increasing the working capacity of the left auricle and right ventricle, so tending to counteract the effects of the lesion, and to maintain an efficient relation between the pressures of the systemic and lesser circulations respectively. In varying degree and for varying periods of time we find, therefore, that the reserve power of the cardiac muscle is sufficient to deal with all the altered circumstances resulting from mitral stenosis, and only when there is definite evidence of the diminution of this reserve of energy will cardiac failure be produced in recognisable form.

DIAGNOSIS.

Symptoms.—Apart from exceptional cases which by reason of their freedom from symptoms may be regarded as latent, the majority of patients with definitely diagnosable mitral stenosis are subject to sensations of discomfort causing varying degrees of physical incapacity. By reason of the interference with pulmonary circulation, and resultant deficient aeration, the patient will usually complain of breathlessness—at first produced only by strenuous effort, extreme emotion, &c., but increasing in intensity, developing under milder provocation, and, in the latter stages of the disease, disturbing the patient at rest, becoming persistent, and tending to produce acute exacerbations from time to time, for no very apparent cause; this last is true paroxysmal dyspnœa, or so-called cardiac asthma.

Linked closely with the sensation of breathlessness, and depending upon similar causes, is the cough which develops with uniform regularity and tends to persist. The sputum as a rule is very fluid, frothy, and frequently tinged with blood; in this disease, more often than in any other valvular affection, pulmonary hæmorrhage is likely to take place with free hæmoptysis; persistent attacks of bronchitis frequently result from apparently trivial causes. Præcordial pain and tenderness are often complained of, and may prove a definite and obstinate incapacity, especially in certain aggravated cases where the pain may assume all the attributes of true angina; otherwise it is customary to find varying degrees of epigastric pain and distress due to hepatic engorgement, also some amount of discomfort under the left breast secondary to disturbances of the gastro-intestinal tract. Attacks of tachycardia and palpitation, also headache and giddiness, are often annoying symptoms. As the disease progresses and cardiac failure becomes more evident the symptoms develop in intensity, and further debilities arise as a result of stasis, which depends upon the inefficiency of the myocardium to maintain the necessary balance of the circulatory mechanism.

A broad review of the symptoms of mitral stenosis shows that they differ but little from those associated with cardiac failure secondary to other varieties of valvular lesions; it is, however, important to appreciate the early appearance of pulmonary complications in this disease, the not infrequent crises which indicate arterial embolism, and the brassy cough, aphonia and hoarseness which certain cases develop as a result of damage to the left recurrent laryngeal nerve.

Physical Signs.

Turning to the question of physical signs, these afford a complicated series of phenomena which can possibly be discussed to the best advantage if we divide the disease into stages; for this purpose it is necessary to analyse the clinical picture with some care. Stage 1 deals with the disease in its undeveloped form, Stage 2 refers to the period of full development, and Stage 3 with that advanced state of the malady in which the failing heart suffers the additional strain and handicap imposed by the change of rhythm, the gross irregularity associated with fibrillation of the auricles.

Stage 1.

The value of a correct appreciation of this undeveloped stage cannot be too strongly emphasised; as the result mainly of post-mortem examinations, and for other no less definite reasons the narrowing of the valve aperture is known to be produced only by slow degrees and in the gradual manner typical of the formation of scar tissue, so that there must be a clearly defined interval between the primary invasion of the valve curtains and the ultimate development of the stenotic process. This interval of time will of necessity be elastic, depending upon the virulence of the first infection, the patient's resisting power, domestic circumstances, sex, occupation, the possibility of a secondary infection, &c.; for clinical purposes, and as a general working rule, a period of from three to six years may be taken as essential for these early changes. During this interval the early symptoms of cardiac failure, including shortness of breath with moderate effort, undue exhaustion, palpitation, general cardiac overaction, &c.—in short, the whole symptom-complex of an impaired exercise tolerance—will tend to become increasingly noticeable; physical signs are few, but by careful examination sufficient can be detected for diagnostic purposes.

The outstanding features helpful in an endeavour to spot the disease prior to its full development may be of two varieties, negative or positive; the negative indications include the following: (1) A normal general appearance with a healthy facial aspect; (2) a heart of normal size, whose resting rhythm is quiet and regular; (3) a pulse regular in time, and normal in size and pressure; (4) entire absence of venous engorgement, jugular, pulmonary and visceral.

The positive indications refer mainly to the sounds of the heart and their variations under different conditions, more especially in those patients, the recent victims of some acute infection, whose reserve of energy is beginning to manifest a restricted field of response. On auscultation, alteration in the quality and pitch of the two heart sounds is at once realised; the first sound is loud and prolonged, approaching the variety described as snapping, and a systolic murmur may or may not follow it: the second sound may be reduplicated at the apex or base, or the normal third heart sound may be audible at the former situation; under special conditions a presystolic murmur will be audible at the apex region; its evanescent appearance is noticed with the tachycardia or raised rate of beat following effort, when the maximum effect of the early valvular damage is in full operation. This fact then provides a diagnostic key of great value in clinical medicine, enabling us to recognise the presence of valvular cicatrisation in its very early form, and to understand that the developing lesion passes through a definite stage during which its ill-effect upon the heart's mechanism is manifested only when an extra demand is made upon the circulation and the heart rate, in consequence, is unduly raised.

The practical deduction we arrive at is that, before excluding mitral stenosis, we must, in doubtful cases, examine the heart's sounds both in the active and resting phases; the active stage may be rapidly produced by instructing the patient to carry out some form of muscular effort; this being completed, auscultation is at once proceeded with, preferably in the recumbent position; more often than not, probably, the typical murmur preceding and running up to the loud first sound is audible only for quite a

few beats after the exercise when the lesion is an early one; later the murmur will persist for a long time after its production, and its presence will be noted following efforts very slight in character—even after simple changes of position, from back to left side when lying, &c. In certain cases physical exercise may for some reason be contraindicated, and some alternative method of acceleration of the heart must be adopted—as, for instance, inhalation of amyl nitrite or subcutaneous injection of atropine—to remove temporarily the controlling influence exerted under normal circumstances by the autonomic nervous system through the vagus nerves.

By one of these ordinary methods it is invariably possible sufficiently to raise the heart rate for diagnostic purposes; the presence of the early stage of mitral stenosis may be confidently assumed in cases which manifest the typical presystolic murmur, however fleeting the latter may be.

Stage 2.

Passing next to the period of full development of the lesion a clinical picture is recognised displaying the following complex series of physical signs. Certain striking peculiarities in the facial appearance are seen—a dusky malar flush, with a tendency to cyanosis of the lips and mucous membranes generally, is commonly but not always observed; frequently the facial aspect is one of profound anæmia in spite of the invariable abnormally deepened tint of the lips. Peripheral cyanosis is usual, and clubbing of the fingers may be present.

The præcordium is frequently unduly prominent, and a variety of abnormal signs are observable by inspection of this area; the apex beat is wavy and diffuse, involving several spaces, and extending unusually far to the left of the mid-sternum; systolic retraction of the area to the left of the sternum, which overlies the right ventricle, can be detected in many cases where cardiac overaction is present, and a systolic impulse may sometimes be seen in the second left interspace, depending upon the exaggerated pulsation of the pulmonary artery.

Palpation reveals phenomena of outstanding importance; at the apex a fine purring thrill, which terminates in a short tapping systolic shock, at once attracts notice; the duration of the thrill may occupy the whole or only a portion of the diastolic interval; in the majority of cases it is sharply localised to the immediate vicinity of the apex beat, otherwise a wider diffusion will obtain, especially in patients whose chest walls are thin and wasted. In addition to the palpable shock of the first sound at the apex region there may be present also a well marked shock, diastolic in time, at the pulmonary area, produced by the forcible closure of the pulmonary valves.

The pulse at the wrist is usually small, and, until the development of the final stage of the disease, fairly regular; premature breaks are a frequent occurrence; the systolic blood pressure differs but little from the normal; as a result of generalised vaso-constriction there is often an undue elevation of the diastolic reading, accounting for the diminished pulse volume observed with such uniformity in mitral stenosis.

In the region of the apex cardiac dullness may not exceed the normal limit, but with the progress of the malady some cardiac hypertrophy will develop, so that the left border of the dullness will extend unduly in the direction of the axilla, and the right margin will reach to, or even beyond, the right sternal edge, depending more especially upon the size and degree of engorgement of the right auricular chamber. At the base of the heart the limit of dullness extends higher and farther to the left than is ordinarily the case, indicating enlargement of the conus arteriosus and pulmonary artery.

The auscultatory signs by which mitral stenosis is recognised are admittedly complex, differing remarkably in essential detail from the phenomena which determine the diagnosis of the other varieties of valvular mischief, and also changing materially with the progress of the disease. Mindful of the presystolic murmur, which can be rendered audible by appropriate methods in the early stages of the disease, one can perhaps more readily appreciate the significant changes revealed by auscultation when the narrowing process becomes fully developed; they may be taken to include:—

1. An apical presystolic murmur whose pitch and intensity rise with extreme rapidity to terminate in a loud snapping first sound.

2. An apical diastolic rumble, which, commencing shortly after the second sound, may extend up to, and mingle with, the presystolic murmur. It therefore happens quite frequently that a long murmur occupies the whole period of diastole, commencing with the opening of the auriculo-ventricular valves and terminating at their closure; the first part of the murmur depends upon vibrations set up by the flow of blood through the constricted mitral orifice, the latter or crescendo portion being produced by the auricular contraction, which of necessity becomes an extremely forcible event in this disease.

3. A systolic murmur at the apex, indicative of mitral regurgitation, rendered inevitable by the sclerotic changes which induce varying degrees of rigidity of the valve and incidentally obviate its closure.

4. An accentuation of the second sound at the pulmonary area indicative of a rise of pressure in the lesser circulation.

5. A diminution, possibly an entire absence, of the second sound at the apex, which we may infer is the result of the lessened output of the left ventricle, and the reduction in systolic blood pressure.

6. A diastolic murmur audible at the left sternal margin, described by numerous observers, and attributed to a functional insufficiency of the pulmonary valve, but having little beyond an academic value, and calling for comment on account of its resemblance to the diastolic murmur of aortic insufficiency; several important differences will, however, guide a differential diagnosis between the two lesions; the close proximity of the aortic and pulmonary orifices, and the fact that incompetence of either occasions a similar type of murmur with maximum intensity in the region of the third left interspace at the costal margin, make it plain that the propagation of the murmurs is likely to differ; for practical purposes the pulmonary diastolic murmur is sharply localised, whilst the murmur of aortic incompetence is conducted by the blood stream not only to the region of the apex but also to the aortic area and systemic vessels; moreover, the latter murmur is accompanied by an easily recognised collapsing quality of the pulse.

Stage 3.

The third and final stage of mitral stenosis has reference to that period of the disease in which all the extreme symptoms of heart failure develop, secondary not only to the advanced degree of the valvular narrowing, and to the coexisting myocardial changes, but also to the onset of auricular fibrillation, which produces a rhythm of such gross irregularity as seriously to embarrass the heart's functional capacity; so frequently, moreover, does auricular fibrillation arise in the latter phases of mitral stenosis, that its development may be regarded as a certain indication that the malady has reached its terminal stage.

As a rule patients are fully conscious of the degree of their disease at the time of the appearance of auricular fibrillation: existing symptoms are aggravated, reserve power is further curtailed, physical signs of extreme failure tend to become increasingly evident, and complications of a serious character are likely to develop; hence it is highly important to possess an adequate supply of evidence for the recognition of auricular fibrillation.

Points Revealed by Examination.

An ordinarily careful physical examination will generally give all details necessary for diagnostic purposes, but instrumental investigation, either by means of the electrocardiograph or the clinical polygraph, may also be required.

The main points revealed by examination are the following:—

1. The gross irregularity, and usually the extreme frequency of the heart beat, the former being more evident with the higher rates.

2. The discrepancy which often obtains between the rates of heart and pulse, several of the smaller contractions of the former being apparently unable to produce an appreciable arterial pulsation.

3. An alteration in the auscultatory phenomena at the apex region; the presystolic murmur is no longer audible, the auricle being unable to execute coördinate contractions; the accentuated first sound will, however, persist, also the systolic murmur; the diastolic murmur, if previously present, will remain.

These important physical signs merit most careful consideration, as they provide ample evidence for the diagnosis of auricular fibrillation, and prove that, in the majority of cases, instrumental methods are merely confirmatory agents; the polygraph curve displays to great advantage the irregularity of the force of the heart beat and the entire absence of anything approaching a dominant rhythm, and also a venous curve of the ventricular form; the electrocardiograph will show ventricular complexes pursuing a rhythm of perpetual irregularity and varying in height from beat to beat; an entire absence of "P" waves preceding the ventricular complexes is also observed together with the presence of certain minute waves between the ventricular beats indicative of the small movements of the auricular musculature. Auricular fibrillation may thus be readily detected by ordinary examination in most cases; experience shows that this disorder will generally be permanent and largely responsible for complications, being also the underlying factor on which depends the aggravation of symptoms and signs. The latter progress with varying rapidity, differing little in detail from those which characterise the cardiac failure accompanying other forms of chronic heart disease; the heart enlarges considerably, and evidence of stasis in the pulmonary circulation becomes increasingly evident; with gradual intensification of myocardial weakness venous engorgement tends to become a conspicuous feature; serous effusions develop, and before long the following complications will appear:—

1. *Alterations in rhythm.*—Of these the most important is that which characterises auricular fibrillation considered above; mention may also be made of premature contractions, which frequently disturb the existing rhythm of the heart beat, and of intermittently occurring attacks of tachycardia—of simple type, due to temporary acceleration of the normal rate of beat, or true paroxysmal tachycardia, in which the seat of origin of the heart's contraction has shifted temporarily from the normal situation—and the irregularity of rhythm which depends upon the intermissions of heart-block, a not infrequent process in the spread of myocardial degeneration.

2. *Pulmonary.*—These include bronchitis, pulmonary congestion, and hæmoptysis; the lesser circulation being engorged, small vessels frequently rupture, and the sputum in consequence becomes blood-tinged; at times profuse and obstinate bleeding may seriously prejudice the patient's condition.

3. *Paralysis of the left recurrent laryngeal nerve.*—In a small percentage of cases this nerve becomes paralysed; in consequence the voice becomes weak and the cough brassy; the nerve injury is produced by slow and gradual compression, depending directly upon the upward pressure exerted by the enlarged left auricle on the left pulmonary artery.

4. *Cerebral embolism.*—This may occur as the result of the detachment of a small vegetation from the valve surface, or by the escape of a small fragment of clot from the cavity of the dilated auricle, where thrombus formation is a usual event after the onset of fibrillation.

5. *Attacks of angina pectoris.*—Pain and præcordial distress are quite usual in cases of mitral stenosis, but true angina pectoris is apparently comparatively rare in this disease.

Morbid Anatomy.

The mitral orifice is narrowed and distorted; the opening may be reduced to a mere slit between the rigid margins of the valve, or may take the form of a small circular orifice at the bottom of a dense sclerotic funnel extending downwards for a varying length from the region of the mitral ring; the margins of the valve are thick, irregular, and possibly studded with vegetations; the surface of the valve cusps is uneven, presenting a scarred and puckered appearance; dense masses of fibrous tissue extend from the bases of the valves, involve the angles where the cusps adjoin, and weld the valve structures firmly together; the chordæ tendineæ are shortened and thickened into dense white cords; the left auricle is enlarged; its wall is hypertrophied, both endocardium and musculature being involved in the process; the dilated cavity of the auricle frequently contains one or more globular thrombi; the pulmonary veins at their entrance to the auricle are considerably dilated; the condition of the left ventricle varies—in the majority of cases it is definitely hypertrophied, but sometimes there is an apparent reduction in the thickness of the chamber walls, resulting from a diminished entry of blood; the right ventricle is invariably hypertrophied; the lungs are enlarged, and their tissue is abnormally firm by reason of chronic venous stasis and of coexisting fibrotic changes.

TREATMENT.

With a full appreciation of the varied clinical picture presented by the disease during its progress, and of our limitations in the matter of interference with fibrotic changes and sclerosis in the structure of the valve, we know that certain forms of treatment may delay the course of the malady, and add effectually to the comfort of the patient. In the early stages all possible preventive measures should be adopted; the patient should be instructed to lead a quiet, regularly-ordered life, free from worry, anxiety, or physical strain; exercise in the open air, short of the least suspicion of fatigue or distress, is important; strenuous games and pursuits must be forbidden, but amusements such as golf, cycling on the flat, walking, light gardening, or other similar hobby may be allowed. An ordinary easily digestible diet in moderate quantities should be taken; the value of adequate mastication and the necessity of a short rest after each meal should be emphasised; smoking should be forbidden, to obviate irritation of lung tissue which is already the seat of some degree of venous engorgement. Shortness of breath, a slight cough, and others of the early symptoms are frequently associated with poor nutrition or some degree of anæmia, and will respond to dietary changes, a course of iron and arsenic or other simple measures.

Deficient exercise tolerance, undue exhaustion with moderate effort, palpitation, præcordial discomfort, &c., are common indications that the reserve power of the heart is suffering reduction; weakness of the heart muscle becomes unmistakable; small doses of digitalis should be prescribed in short courses. The most efficient method to adopt is to give a moderate dose (e.g., ℥ x. of tincture of digitalis) three times daily on two days (Saturday and Wednesday) in the week, or, as an alternative, to prescribe a larger dose (e.g., ℥ xx.-xxx. of tincture) every third day at bedtime; this line of treatment will usually be attended with much relief to the patient; bronchitis, cough, and pulmonary congestion, common complications in mitral stenosis, are more likely to be relieved by treatment of the heart than by expectorants or other agencies directed towards the lungs; if the sputum is tenacious and the cough irritable it is, however, wise to prescribe a simple expectorant mixture combined with some reliable sedative, such as tinct. camph. co.

Hæmoptysis in small amounts does not call for special treatment; if excessive the patient should be kept at rest, and morphia in small doses may be given; premature contractions and attacks of paroxysmal tachycardia are frequent events failing, as a rule, to respond to treatment; fortunately the patient is not invariably conscious of their presence, and in such cases it is advisable to disregard their occurrence. With the arrival of auricular fibrillation there is usually intense aggravation of all existing signs; the first indication is complete rest from

bodily exertion and from anxiety or worry of any kind; digitalis should be prescribed in large doses until its full physiological effect is produced; it will be well, unless cardiac failure is extreme, to commence with a dose of 20 minims of the tincture every four hours; this is usually found to be sufficient to produce a satisfactory reaction in three to four days; having reduced the rate of heart beat to reasonable limits, it is advisable to diminish the dose of the digitalis, endeavouring, during the process, to maintain the rate between 70 and 80.

In certain cases the well-known toxic effects of digitalis may be produced; prescription of this drug must always be undertaken with extreme caution; the tendency to gastric disturbance may at times be obviated by giving the digitalis in ice-cold albumin water, or mixed with a small quantity of brandy; in other instances the drug may be given in pill form, the digitalin granules of Nativelle being perhaps the most satisfactory. The beneficial effect of digitalis upon the heart may so improve the whole physical state of the patient that other complications requiring special treatment may not arise; in the later stages of the disease, however, certain important debilities usually become manifest, and we must be prepared to adopt quite early all the principles of a well-judged and cautious therapy.

Diet is important; light, easily-digestible articles of food should be selected; the meals should be small in bulk and taken at frequent intervals; the amount of fluid should be considerably curtailed, especially if any tendency to dropsy be observed; gastric catarrh, if obstinate, will best be treated by stopping all food for two or three days, only ice, with possibly a small amount of stimulant, being allowed during this time; diet may be cautiously resumed later, beginning with milk and lime water, effervescing drinks, beef juice, bread and milk, egg albumin, &c., in combination with medicinal agents, such as hydrocyanic acid, oxalate of cerium, tincture of iodine, or carbolic acid. In moderation the patient may be allowed to gratify his own fancies; in the first few days jellies, custard, biscuits, toast and some variety of appetising sandwich, will be appropriate, leading later to eggs in some form, boiled fish, scraped beef, fowl, sweetbreads, &c., with a small amount of some favourite vegetable; fresh fruit in the form of grapes or oranges may be encouraged; fluid should include milk and soda, weak tea or coffee, lemonade, and barley water; a small glass of champagne with the lunch and supper may be prescribed with advantage.

Without sufficient sleep recovery will tend to be very protracted; it may be sufficient if the patient takes some warm stimulant, such as whisky or cognac, or some mild hypnotic—a small dose of ammonium bromide, sulphonal, trional or veronal—may serve to induce sleep; obstinate insomnia necessitates prescription of chloral or opium in some form: for extreme dyspnœa morphia is invaluable, and should be given without hesitation.

Palpitation is a most distressing symptom, improvement of which should come about with the diminished heart rate produced by the digitalis medication; otherwise it will be well to try the effect of an icebag to the præcordium, or counter-irritation by some one of the well-known methods; palpitation is frequently secondary to flatulent indigestion, and efficient treatment of the latter will result in its complete disappearance. For dropsy, which so often aggravates the physical condition, a mercurial purge may be all that is necessary, or some simple diuretic mixture, or the compound digitalis pill which contains both mercury and squills in addition to the digitalis powder; more obstinate cases necessitate the use of Southey's tubes or acupuncture; massage and careful bandaging frequently control the mischief and always add to the comfort of the patient. Serous fluid collecting in any of the visceral sacs should be carefully watched and removed if it interferes with the functions of the organs involved.

Extreme degrees of failure may develop at any time in patients in the final stages of mitral stenosis; in such cases strophanthin, administered by intravenous injection, may prove beneficial; diffusible stimulants as ammonia and ether, and other rapidly acting drugs, such as caffeine, strychnine, and camphor, may produce temporary reactions which serve to tide the patient over the critical period; in the presence of venous engorgement, with much distress in breathing, a venesection will give immediate relief; as an alternative method leeches may be applied over the hepatic area or right auricle; in either case oxygen should be simultaneously administered by inhalation.

THE DIAGNOSIS OF DYSENTERY BY THE SIGMOIDOSCOPE.*

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A SEARCH through numerous papers on dysentery which have appeared during recent years has revealed the fact that the advantages to be gained by the routine use of the sigmoidoscope in the diagnosis of, and as a guide to treatment in, chronic dysentery have hardly been appreciated, at any rate in this country. In a monograph which has recently appeared, illustrated by a series of beautiful plates,[1] Bensaude has described the main features of amœbic ulceration as seen through the sigmoidoscope, its differentiation from chronic bacillary lesions and from other diseases of the rectum which may give rise to diarrhœa or dysenteric symptoms. He maintains that the amœbic lesions as observed through this instrument differ considerably from those usually seen at autopsy in being more superficial and much paler in colour. There is a short reference to this subject by Lyons[2] in a general paper on the status of amœbic dysentery in the United States; he has noted that, apart from giving the observer a good view of the ulceration, the diagnosis may be confirmed by the presence of the *Entamœba histolytica* in scrapings obtained from the ulcers, even where the stools have been searched in vain for these organisms. This observer has further recorded his opinion that no case should be discharged as cured without a proctoscopic examination. If this rule were universally adopted, he thinks, there would be fewer relapses and fewer drugs described as specifics.

It is hardly necessary to emphasise that this subject is of very considerable importance at the present time when a very large number of war pensioners are receiving treatment in special hospitals for chronic diarrhœa or dysentery.

In the acute stages of dysentery of both the amœbic and bacillary varieties the routine use of the sigmoidoscope is hardly indicated; usually, in practised hands, a correct diagnosis can be made by laboratory methods. It is in the peculiarly chronic and intractable cases resulting from an original infection acquired three or more years ago, where the laboratory, for reasons shortly to be detailed, can afford little assistance, that familiarity with sigmoidoscopic diagnosis proves very desirable.

During the last year we have used this instrument as a routine measure in making our diagnosis of

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FIG. 1.—Amœbic dysentery.—Typical ulceration with hæmorrhagic margins and isolated hæmorrhages (8 ins. from anus).

FIG. 3.—Amœbic dysentery.—Showing two superficial ulcers, dark blood clots of some considerable size. Numerous entamœbæ demonstrated in scrapings of ulcers; none found by microscopical examination (2 ins. from anus).

Sigmoidoscopic Appearances in Dysentery.

Figs. 1-3 and 5-7, reproduced from the author's water-colour drawings, have lost some of the finer distinctions in the process. Fig. 2 is rendered the same size as the original drawing in order to give an idea of the actual image seen by means of the instrument. The others are about half scale.

FIG. 2.—Amœbic dysentery.—Showing redundant mucous membrane, superficial diamond-shaped ulceration, and dark hæmorrhagic clots (4 ins. from anus).

dysenteric cases among war pensioners at the Hospital for Tropical Diseases, and we can confirm the statements already quoted as to its great utility. In fact, as the result of this work, we venture to qualify considerably the views already expressed.

It is hardly necessary to state that quite a number of our amœbic cases gave no history of "dysentery," as this term is generally understood—that is to say, the appearance of blood and mucus in the stools—but rather complained of attacks of recurrent diarrhœa: in fact, it would be much more appropriate to describe these cases of amœbiasis as "amœbic diarrhœa," a term which Dobell[3] has already sanctioned. The clinical history which one can obtain in these cases, the oft-repeated story of relapses of "diarrhœa" and "dysentery" alternating with periods of quiescence and the fact that the majority of these men originally contracted their dysentery in countries where *Entamœba histolytica* is widely distributed, would primarily suggest that the majority are amœbic in origin, but it is a fallacy to presume that all are due to this organism. A certain number are due to other causes, and in them the intestinal symptoms are by no means improved, it may be they are actually aggravated, by a misdirected anti-amœbic treatment. On the other hand, we have found that it is not wise always to assume that the patient's present symptoms are due to a recurrent bacillary infection, even in cases in whom the specific dysentery bacillus was primarily isolated during the war, for occasionally we meet with cases who, though undoubtedly in the first instance the victims of bacillary dysentery, have subsequently contracted amœbiasis.

Unfortunately mere physical examination of these chronic dysentery cases affords but little assistance in making a definite diagnosis. As a general rule, chronic bacillary cases are more emaciated and debilitated than are the victims of chronic amœbiasis; this is probably due to the more extensive destruction of the intestinal mucosa which occurs in the former disease, and to a chronic toxæmia from secondary organisms. In amœbiasis, by abdominal palpation, areas of deep tenderness can generally be elicited over isolated portions of the large intestine such as the cæcum and the transverse and pelvic colons, whereas in post-bacillary cases the whole abdomen is very tender and sensitive to pressure. These somewhat indefinite signs, however, are by no means always reliable.

Routine Uses of the Sigmoidoscope.

Many excellent arguments can be advanced for the routine employment of the sigmoidoscope in the diagnosis of these conditions, and we wish to lay stress upon some of the more important.

In chronic bacillary dysentery of several years' standing little or no assistance may be obtained by the employment of laboratory methods; for this failure the secondary pathological changes which have taken place in the mucosa of the large gut are responsible. These changes are due to the deposition of granulomatous and fibrous tissue resulting from the

destruction of the mucous membrane; in bacillary dysentery this is usually more extensive in the lower portion of the rectum than elsewhere and consequently is easily visible through the sigmoidoscope.

It is hardly necessary to state that a simple microscopic examination of the fæces is not of much value in such cases, nor can one expect any assistance from attempts to culture the dysentery bacilli, either from the excreta or from scrapings of the mucosa, as these organisms have long since disappeared; for the same reason, serological reactions are no longer diagnostic. In chronic amœbiasis there are drawbacks also in establishing a definite diagnosis by any of the well-recognised methods of laboratory examination. It is now well known that in such chronic cases histolytica cysts may be passed in the fæces in an extremely irregular manner: it may be that they are present in considerable numbers on one or two occasions, so as to be easily visible under the microscope, but that subsequent examinations, for days or even weeks on end, may be negative as regards this organism. We may instance one particular case in which 11 fæcal specimens were examined daily with negative results during the fortnight the patient was in hospital for observation, but on the twelfth occasion numerous characteristic cysts were seen; this occurred while he was being actively purged and was passing stools containing much blood and mucus. Cases of a similar nature have been cited by others who have had a large experience of this disease; the value of repeated microscopical examinations in detecting *Entamœba histolytica* carriers has been ably emphasised by Dobell in his numerous publications on this subject. In 1917[4] he recorded a case which was diagnosed on the thirty-fifth consecutive examination, and doubtless there are more extreme instances than this. In his latest publication,[5] in summarising his experiences, he has stated that a series of such cases examined once apiece may be expected to disclose about one-third of the infections actually present; in a series examined thrice per case between one-half and two-thirds of the actual number of infections will have been detected. In order to be on the safe side, as a routine measure, six consecutive microscopical examinations would be necessary in every case. Even in more acute stages of the disease, when quantities of blood and mucus are being passed in which the active vegetative entamœbæ can be easily found, it does not necessarily follow that the characteristic histolytica cysts will appear in the fæces after the subsidence of the more acute symptoms. We have recently seen three cases who passed typical motions on one occasion, but whose stools were examined on several occasions after admission to hospital with negative results. To clinicians it is becoming obvious that, as a method of excluding amœbiasis in diagnosis, many microscopical stool examinations are required for each patient, and incidentally much delay must ensue before a diagnosis can be made or a rational treatment instituted. Any aid to diagnosis which will obviate this delay should be encouraged as saving both time and money. Having ourselves been engaged for a considerable period on routine stool examinations we do not wish to make any statements which would tend to bring such a well-established method into disrepute, but it has its limitations, as every experienced microscopist will admit.

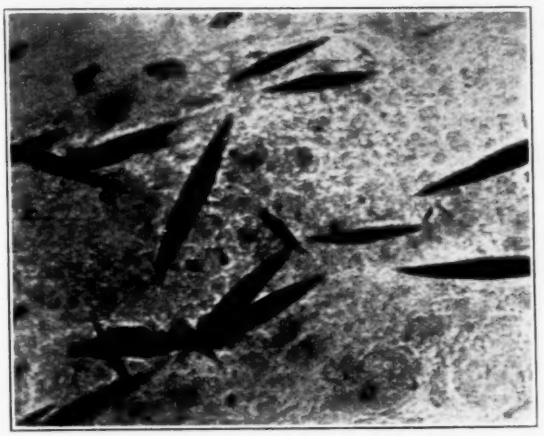

FIG. 4.—Charcot-Leyden crystals. × 1200. Preparation from scraping of amœbic ulcer through the sigmoidoscope, showing Charcot-Leyden crystals in numbers, stained by Heidenheim's hæmatoxylin (microphotograph by Dr. J. Gordon Thomson).

The advantages of the routine use of the sigmoidoscope may be stated as follows:—(1) A rapid and accurate diagnosis by direct inspection of the mucosa can often be made. (2) Pathological conditions other than dysentery, and often hitherto unsuspected, such as hæmorrhoids, syphilitic lesions, malignant disease or polypi are occasionally revealed. (3) The very large proportion of cases of doubtful ætiology, which by the employment of simple microscopical methods would remain undiagnosed, is reduced to a minimum.

FIG. 5.—Chronic bacillary dysentery. —Grazed and granular appearance of mucosa due to formation of granulation tissues.

FIG. 6.—Chronic bacillary dysentery. —Deposition of granulation tissue and fibrosis.

FIG. 7.—Chronic bacillary dysentery. —Showing large polypi (4 ins. from anus).

Preparation of the Patient.

The method adopted in making a sigmoidoscopic examination is comparatively simple, but it is necessary to emphasise one or two points. The preparation of the patient requires consideration. He should be purged so that the large bowel is emptied of fæces, but at the same time it must not be rendered too irritable. We have found that the

most satisfactory method consists in administering half an ounce of castor oil on the previous evening, followed in the morning by a soap-and-water enema so as completely to clear out the rectum. In order to decrease peristalsis and render the bowel less sensitive to manipulation we find it advisable to administer 15 minims of tinct. opii immediately after the enema. In cases where there is incessant diarrhœa a satisfactory method of clearing out the bowel has yet to be discovered, but, fortunately, in these cases a fleeting glimpse of a small portion of the bowel usually suffices to establish a diagnosis.

As regards the posture assumed to the patient during examination, we prefer the lithotomy position. This method allows any fluid contents of the bowel to collect in the dorsal curvature of the rectum, which acts as a sort of a trap, while the bowel, both above and below this pool, may be minutely scrutinised. It is quite unnecessary, indeed, to our minds it is disadvantageous, to administer an anæsthetic. One should be guided by the patient's sensations of pain or discomfort while the instrument is being passed; the former should not be present in examining a normal bowel. Naturally, when one intends to examine an ulcerated bowel, great care should be exercised in introducing the instrument, and when once the sphincter muscles have been passed its further passage should be guided by sight alone. The degree of pain experienced varies greatly. Generally it is much greater in the bacillary types than in the amœbic disease; it is much greater in highly-strung and nervous individuals than in less sensitive subjects. The ulceration of the bowel would seem to have little bearing upon this point, for some cases with extensive ulceration complain of little or no discomfort whilst being examined. It is wise not to disregard any sudden pain of which the patient complains, for this is generally due to too great pressure being exercised upon one particular portion of the bowel wall. The distance to which the instrument can be passed also varies considerably; in some a length of only a few inches, in others again 12 inches or so, may be reached with ease, and the point of the sigmoidoscope can be distinctly palpated in the left hypochondrium.

Sigmoidoscopic Appearances of Amœbic Lesions.

In those cases in whom the amœbic lesions extend into the rectum the appearances vary pretty considerably, but they are sufficiently characteristic to be diagnostic. As a rule discrete ulcers can be made out; they vary in shape and in size. Some are barely visible, while others are 6–8 mm. in diameter. No lesions occupying several inches in extent, such as often may be seen in the large gut at autopsy, have as yet been met with. The ulcers are usually oval or diamond-shaped; their margins are hæmorrhagic, and their bases covered with grey-coloured or greenish sloughs. In depth they also exhibit considerable differences; they may be quite superficial, or they may involve the submucosa (Fig. 1). The mucous membrane intervening between the individual lesions is healthy in appearance and of an orange-rose colour. Generally it is more redundant and reticulated than is the normal (Fig. 2).

Flame-shaped hæmorrhages are usually numerous; the smaller ones can be described as having a dark hæmorrhagic centre surrounded by an areola of a brighter hue. The larger ones may form patches of an irregular shape and may involve considerable areas of mucous membrane; others again of intermediate size lie concealed between the folds of puckered mucous membrane (Fig. 3). On the whole, the lesions resemble those seen in the large intestine at autopsy, but it has struck us that the small petechial hæmorrhages and the vivid coloration of the blood clots are much more apparent than when seen in the cadaver, which is only what one would expect from a study of living tissues.

As a further confirmation of the amœbic origin of the lesions the ulcers may be scraped and the exudate thereby obtained examined microscopically. A convenient instrument for this purpose is a wooden match affixed to a holder and introduced through the tube of the sigmoidoscope. By this means we have been able to demonstrate active entamœbæ often in considerable numbers, as well as Charcot-Leyden crystals, which are by some considered to be strongly suggestive of amœbiasis (J. Gordon Thomson[6] and H. W. Acton[7]), even in several cases in which numerous fæcal examinations failed to reveal either active entamœbæ or their cysts (Fig. 4). In a few cases of undoubted ætiology—that is to say, of microscopically diagnosed cases—the rectum and colon as seen by the sigmoidoscope were normal in appearance, and in these one has to presume that the amœbic lesions are situated in the upper portion of the large bowel beyond the range of vision through the sigmoidoscope.

Sigmoidoscopic Appearances of Post-Bacillary Lesions.

The changes seen in the lower bowel in this very serious condition consist for the most part of granulation tissue, and may be regarded as an attempt on the part of the bowel to replace, as far as is possible, the tissues originally destroyed by the toxins of the dysentery bacillus. Acute inflammatory changes, when present, are possibly due to a secondary invasion of the mucosa by other intestinal organisms. Up to the present we have not seen cases in which actual ulceration of the bacillary type was present in the rectum.

The changes observed by us may be classified according to their severity in the following manner:—

(*a*) In comparatively slight cases there is an injected and plush-like appearance of the mucosa, while the passage of the instrument is attended by considerable pain.

(*b*) In more advanced cases the mucosa is hyperæmic and has a granular or glazed appearance. The whole rectal canal may be in this condition, or definite annular zones, three or more inches in extent, may be affected (Fig. 5).

(*c*) Masses of granulation tissue, which is very friable and vascular, may be seen superimposed upon a much scarred and fibrotic membrane (Fig. 6).

(*d*) The most advanced stage represents merely an exaggerated phase of the process just described, and takes the form of vascular polypi attaining even as much as ¾ inch in length; the pathology of this curious polypoid condition was described by one of us[8] in a recent paper (Fig. 7). This polypoid condition may extend through the large intestine, for similar changes have been seen in the cæcum in two cases in whom the bowel was opened at operation. It is scarcely necessary to add that the clinical condition of these cases is one of great severity.

The table of statistics which follows will serve to illustrate the various points to which we have alluded in this paper.

DIAGNOSES IN 100 CONSECUTIVE CASES OF SUSPECTED DYSENTERY.

Diagnosis by Sigmoidoscope.			*Diagnosis by Microscope.*		
Positive amœbic ..	29	42	Positive amœbic ..	30	31
Suggestive of ,, ..	13		Suggestive of amœbic (Charcot-Leyden crystals)	1	
Positive bacillary ..	15	28	Positive bacillary ..	0	5
Suggestive of ,, ..	13		Suggestive of ,, ..	5	
Other causes of symptoms:—			Remaining of no positive value (exams.)	211	
Rectal polypus	1				
Hæmorrhoids	4		Total microscopical exams. done on these 100 cases ..	247	
Syphilitic stricture ..	1				
Ætiology undiagnosed	11				
Normal appearance	14				
	101*				

* This extra number is explained by the diagnosis of amœbic and bacillary infection in the same patient.

These preliminary examinations were all performed before a diagnosis was established.

Details of Sigmoidoscope Results.

Forty-four positive diagnoses were made, and of these:—

20 were confirmed by the microscope.
15 others were confirmed by the clinical history of the patient.
In 8 the clinical history was doubtful and confirmation of the diagnosis is lacking.
In 1 the history disagreed with the diagnosis, which was subsequently proved to be correct on clinical grounds.

Twenty-six suggested diagnoses were given, and of these :—

6 were confirmed by microscope.
10 others were confirmed by the clinical history.
In 5 the clinical history was doubtful, and confirmation of the diagnosis is lacking.
In 5 our diagnosis was probably wrong.

Thus there were 52 confirmed diagnoses of amœbic or bacillary dysentery, and there were 6 cases in which the symptoms were caused by other local conditions, such as hæmorrhoids, &c.

Of the remaining 43 cases :—

11 were undiagnosed.
11 appeared normal, and of these :—
In 1 the clinical history was doubtful.
6 had no symptoms and were discharged.
1 had *Entamœba histolytica* cysts and a liver abscess, but had never had dysentery.
2 had *Entamœba histolytica* cysts in their stools.
3 gave a history of amœbic dysentery.
1 ,, ,, ,, bacillary ,,
13 lack confirmation.
In 5 our diagnosis was probably wrong.

In other words, the sigmoidoscope was instrumental in giving a positive diagnosis—that is, a confirmed diagnosis—from a single examination in just 58 per cent. of our cases, while in the same 100 cases microscopic diagnosis, after repeated tests, gave about 30 per cent.

In conclusion, we wish to express our indebtedness to Dr. G. C. Low for generously permitting us to utilise figures obtained from cases under his care. Many of the routine microscopical examinations of fæces so frequently quoted in this paper were undertaken by Dr. J. Gordon Thomson, whom we also wish to thank for his assistance, as well as for his kind permission to reproduce his excellent microphotograph of Charcot-Leyden crystals (Fig. 4).

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A METHOD OF OPERATION FOR THE TREATMENT OF ECTOPIA VESICÆ.

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THE modern treatment for ectopia vesicæ is to divert the ureters into the bowel. The trigone of the bladder may be transplanted into the sigmoid colon by the intraperitoneal route (Madyl, Stiles, Coffey), or the ureters may be transplanted into the rectum by the extraperitoneal route (Peters, Moynihan). I wish to describe a method of operation which I have employed in four cases of ectopia vesicæ with very satisfactory results.

Method of Operation, Advantages, and Age at which it should be Performed.

The operation consists briefly in transplanting the ureters directly into the rectum through its anterior wall above the level of the peritoneal reflection of Douglas's pouch, the general peritoneal cavity being shut off by suture before opening the bowel.

The operation is very simple to perform and can be completed in less than 30 minutes, thus involving little or no shock. It avoids the risk of infective peritonitis, owing to occasional leakage of the intraperitoneal operation, and the danger of subsequent retraction of the ureters into the bladder wound of the extraperitoneal method.

The operation should be postponed until the child attains the age of 2 years when the anatomical structures are large enough to facilitate the necessary dissection, manipulation, and suturing, and when the after-treatment can be carried out with greater satisfaction.

Preliminary Treatment.

Hexamine and acid sodium phosphate in suitable doses are administered to minimise the risk of ascending pyelitis. Occasionally after operation the child suffers from attacks of pyrexia accompanied by vomiting, irritability, and drowsiness, probably due to infective pyelitis. These attacks are liable to recur but tend to diminish gradually and can be controlled by giving urinary antiseptics. The skin is prepared in the usual way and the rectum is cleansed by frequent irrigation. The exact position of the ureters should be determined in order to avoid delay at the time of operation, as the orifices may lie rather concealed in folds of mucous membrane.

Description of the Operation.

The pelvis is raised on a small sandbag. I prefer to stand on the left side of the patient. After passing a small probe, a No. 2 Black French catheter (the end of which has been removed to leave a terminal opening) is inserted into each ureter for a distance of from 2 to 3 inches, and is sutured in position by a fine catgut suture inserted with a fine straight needle which transfixes the catheter and the bladder mucous membrane at a distance of ½ inch from the summit of the ureteral papilla.

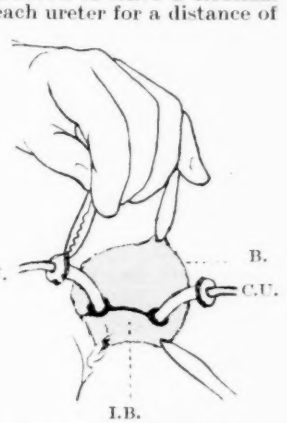

FIG. 1.—C.U., Catheter in ureter. B., bladder. I.B., Incision through bladder between ureteral pouches.

The mucous membrane is then incised circularly at a distance of 1 inch from the orifice of the ureter and the incision is carefully carried through the bladder wall until the wall of the ureter is reached. Great care must be taken not to injure the ureter and its vessels. The ureter is freed by dry gauze dissection, and by snipping a few fibrous bands with scissors or scalpel, until about 2 inches of the ureter can be drawn into the wound (Fig. 1). The assistant then inserts a finger of the right hand into the rectum and presses its anterior wall into contact with the posterior wall of the bladder at a level well above the uterus, which can be readily felt in the female, and at a corresponding distance in the male. The bladder wall lying between the ureteral pouches is then incised transversely (Fig. 1) on to the assistant's finger until the peritoneal cavity is opened, when the anterior rectal wall at once protrudes through the incision thus made (Fig. 2).

Fine catgut sutures are passed through the cut edges of the bladder wall and the sero-muscular coat of the rectum so that an area of the anterior surface of the rectum measuring about 2 in. by 1 in. is completely shut off from the general peritoneal cavity (Fig. 3). Through this area a transverse incision about 1½ inches long is made into the bowel whilst the assistant partially withdraws his finger (Fig. 3). The catheters are then passed through the opening, taken by the assistant, and carefully drawn from the anus until the ureters with their surrounding mucous membrane lie just within the rectum. The opening into the rectum is then closed with catgut sutures in such a manner that the ureters are fixed

firmly at the angles of the wound (Fig. 4). The transverse incision in the bladder is sutured over this. No attempt is made to remove any of the bladder wall. This is better dealt with at a second operation.

After Treatment and Results.

The ureteral catheters commence to drain within a few hours and become loosened within 5 or 7 days, when they are withdrawn. If either catheter ceases to drain before this it must be removed and can easily be loosened by twisting movements, traction being avoided. Hexamine and acid sodium phosphates are given for the reasons previously mentioned.

About six months later the mucous membrane of the bladder is excised and the raw surfaces brought together by under-running strong silkworm-gut sutures. The transplanted ureters readily accommodate themselves to their new anatomical relations, and development is not interfered with.

At the provincial meeting of the Section of Diseases of Children of the Royal Society of Medicine held in Manchester in July, 1920, I showed a patient on whom I had performed this operation in October 1908. The uterus appears normally developed and she menstruates regularly. The rectum carries out its double function independently. Fæcal evacuation usually occurs once daily and urine is voided separately, three or four times by day and not at all during the night. The diagrams have been made from photographs taken during an operation, and I am much indebted to Dr. W. E. Fothergill, who has kindly drawn them for me.

FIG. 2.—P.R.W., Pouch of anterior rectal wall pushed through bladder incision by finger in rectum.

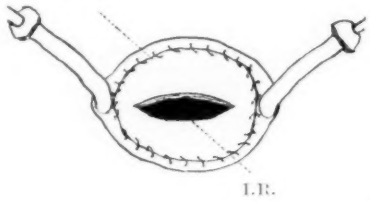

FIG. 3.—P.C.R., Peritoneum covering of rectum stitched to peritoneum covering of bladder; I.R., Incision into rectum.

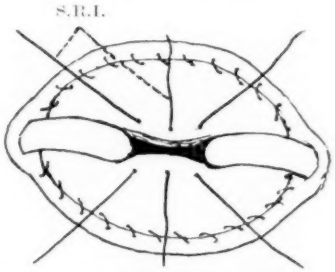

FIG. 4.—Ends of ureters inserted into rectum. S.R.I., Sutures closing rectal incision.

OBSERVATIONS ON THE UREA CONCENTRATION TESTS IN THE PSYCHOSES.

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THE primary objects of this investigation were to discover if there is any undue prevalence of renal inefficiency in the psychoses, as determined by the urea concentration tests in the blood and urine, and, if so, with what forms of mental disorder this condition is associated. During the progress of the investigation it was observed that several cases showed a low urea concentration in the urine with either a normal or subnormal blood concentration. It was therefore thought desirable to estimate the daily excretion of urine with the total excretion of urea and ammonia and the percentage urea concentration in the same. The urea nitrogen and ammonia nitrogen ratio was also determined.

Concentration Tests in the Blood and Urine.

The tests employed were those described by H. MacLean and A. E. Russell,[1] and their instructions as to diet, &c., prior to the tests were strictly adhered to. The urine test commenced at 10 A.M.—i.e., about 2½ hours after a breakfast consisting of bread, butter, and tea. The patient was then put to bed and no further fluid permitted until the completion of the test. Printed instructions were issued on the occasion of every test. The blood was withdrawn between 11.30 A.M. and 12 mid-day—i.e., at the corresponding time, but either on the day prior to or following the urine test. Sufficient blood was always collected to enable a duplicate examination to be made, the average of the two estimations being taken as a measure of the urea concentration. The tests were repeated in a few cases, but as the results were more or less the same it was not considered necessary to do this in all cases.

Prior to and during the collection of a 24-hour specimen each patient received a fixed diet consisting of two pints milk, two eggs, milk pudding, with bread-and-butter. The total excretion of ammonia was estimated by the formalin method. Albumin in all cases was tested for by the salicyl-sulphonic acid and heat tests. The systolic blood pressure was determined during the clinical examination of each case.

Before the results obtained in this investigation are considered, it is necessary to have a clear understanding as to what are considered the normal limits of urea-concentration in the blood and urine. In spite of the fact that W. MacAdam and Bentley Squire[2] give the maximum blood concentration of 25 mg. and 12·5 mg. per cent. respectively, I consider that MacLean's maximum of 40 mg. per cent. is none too high. In Tables I. and II. are cases with a much higher blood concentration with a urine concentration not only between the normal limits of 2 and 4 per cent. as set out by MacLean, but even greater than 4 per cent. Clinical as well as other evidence was contrary to a diagnosis of renal disease in each of those cases. The lowest and highest percentage concentration of urea in the blood found by me in cases showing no evidence of renal disease are 9 mg. and 83 mg. per cent. respectively. But basing my result on the normal standard percentages by MacLean—viz., 15 to 40 mg. per cent. in the blood and 2 to 4 per cent. in the urine, I find there is a large percentage of cases giving abnormal results in which the diagnosis of renal disease, apart from the tests referred to, is not justified.

Eighty-three cases have been investigated. Table III. gives these cases grouped according to their mental disorder with the findings in each. It is seen that 36 per cent. have a normal urea concentration in the blood and urine, according to the limits referred to above. This is a very low percentage. If the cases showing a normal blood concentration with a urine urea concentration below 2 per cent. in which the low urine concentration appears to be due to diuresis, that is, when the total urine excreted in the first and second hours together exceed 350 c.cm.—this diuresis is especially frequent in dementia præcox, and will be discussed later—are considered for the present to be consistent with a healthy condition of the kidneys, the percentage of normal cases is raised to 52. Again, if cases with a normal urine concentration and a blood concentration below 15 mg. per cent. are included for the same reason, the percentage of normal cases is raised to 57. Of the 43 per cent. of the cases remaining

[1] THE LANCET, 1920, i., 1305.

[2] Brit. Med. Jour., 1921, i., 290.

only four could reasonably be considered to be suffering from kidney disease (see Table IV.), and in this connexion it is worthy of note that only two of them have a blood urea concentration over 40 mg. per cent., while they all show a low urea concentration in the urine.

Tables V. and VI. give examples of the remaining unclassified 38 per cent. of the cases. Table V. deals with the cases showing a blood concentration over 40 mg. per cent. in all of whom the urine urea concentration is below 2 per cent. Table VI. deals with the cases having a blood concentration below 15 mg. per cent. and a urine concentration below 2 per cent. The question now arises: Should this 38 per cent. be regarded as explicable by kidney disease, no evidence, clinical or otherwise, being available other than that derived from the concentration tests to warrant such a conclusion? Two explanatory hypotheses are possible in this investigation. These tests were carried out in cases where a nervous or mental element was present as an extra or complicating factor, and perhaps there is in the psychoses, and more especially in dementia præcox, melancholia, and confusional states, a greater incidence of renal disease in a degree not revealed by the ordinary clinical methods than has hitherto been realised. The second and perhaps more plausible hypothesis is that in the psychoses there may be present some factor or factors other than kidney disease to account for the anomalous results obtained. The latter theory is strengthened by three other observations made in the cases of dementia præcox examined—viz., the coexistence of diuresis, polyuria, and acidosis.

Dementia Præcox.

Table VII. deals with the cases of dementia præcox in which it has been possible to compare the results of the concentration tests with those found in the urine excreted in the 24 hours. Although it is wrong to make deductions from a small number of cases, it is worthy of notice that all cases of dementia præcox so far examined show, without exception, a moderate to a marked degree of acidosis, the ammonia nitrogen reaching as high as one-tenth of the urea nitrogen in 4 of the 8 cases. Acidosis was not found in mania, melancholia, and insanity with epilepsy, but a mild degree was found in all of the 8 cases of confusional insanity so examined, and a very severe degree in the only case of general paralysis examined, the ammonia nitrogen being as much as a fourth of the urea nitrogen.

From Table III. it will be seen that diuresis has occurred in almost half of the cases of dementia præcox. From Table VII. it is observed that a low urine urea concentration has been found not only in the concentration tests, but also in the 24-hour specimens. The low urine urea concentrations found in the cases of dementia præcox in Table VII. will confirm this observation. From Table VII. it is seen that there is a high urinary excretion in the 24 hours. In the other psychoses in which the 24-hour excretion of urine has been measured, the amount is found to be low and the urea concentration high. It is difficult to speculate as to the significance of these observations, other than that it may be more than probable that in dementia præcox there exists some general disturbance and not renal disease to account for these anomalous results, such as either a disordered protein metabolism or some form of endocrine disturbance implicating more particularly the pituitary gland.

Summary.

(1) The urea concentration in the blood in the cases examined is subject to wide variations, and therefore

TABLE I.—*Cases without Kidney Disease.*

Blood urea percentage above 40 mg., and urine urea concentration above 4 per cent.

Name.	Age and sex.	Urine conc' test. Amounts (c.cm.). 1st hour.	2nd hour.	Percentage conc. urea in 2nd hour.	Specific gravity.	Reaction.	Albumin.	Blood urea %.	Total amount urine 24 hours (c.cm.).	Urea percentage.	Total urea in grammes.	Total ammonia in grammes.	Urea nitrogen and amm. nit. ratio.	Mental state.	Physical state, &c.
J.W.P.	42, M.	70	36	4·8	1026	A	0	43	—	—	—	—	—	Confusional insanity.	Moderate health, S.B.P. 130 mm.
E.P.	21, M.	25	60	5·37	1025	A	0	50	510	2·2	11·27	0·291	21	Melancholia, dementia præcox, early stage.	Good health. S.B.P. 140 mm.
H.G.	51, F.	0	50	4·1	1015	A	0	83	360	5·0	18·0	0·547	18	Mania during excitement.	Good health, S.B.P. 150 mm.

Remarks.—The above three cases show a high blood concentration with a high urine concentration. It is noteworthy that the total urine for the 24 hours is low, as well as the total urea output; that the total urine excreted as a result of the ingestion of 15 g. of urea in 100 c.cm. water is low; that the blood pressure is raised in all cases; that the chief mental symptom is a combined psychical and motor excitement.

TABLE II.—*Cases without Kidney Disease.*

Blood urea percentage above 40 mg. and urine urea concentration between 2 and 4 per cent.

M. F.	52, F.	90	80	2·1	1022	A	0	73	650	3·1	20·46	0·472	25	Confusional insanity.	Fair health. Glycosuria 2·5 per cent.*
W. F.	58, M.	95	100	2·1	1020	alk.	0	50	—	—	—	—	—	„ „	Fair health. S.B.P. 136 mm.
E. B. L.	35, F.	—	65	3·5	1032	A	0	57	—	—	—	—	—	Melancholia.	Moderate health; slight glycosuria. S.B.P. 102 mm.

* Optic and peripheral neuritis. Noteworthy that acidosis not present.

Remarks.—Three cases showing a high blood urea concentration, with a normal urine urea concentration. It is noteworthy that glycosuria is present in two cases. The explanation other than kidney disease may be that an excessive protein metabolism coexists, with a disordered carbohydrate metabolism. The type of mental disorder predominating is confusion with a moderate degree of excitement.

TABLE III.—*Number of Cases Examined in each of the Psychoses, with the Findings.*

Mental disorder.	No. of cases examined.	Blood urea below 40%, and urea in urine above 2%.	Blood urea below 40%.	Urine urea above 2%.	Urine urea concentration below 2%, with diuresis.	Mental disorder.	No. of cases examined.	Blood urea below 40%, and urea in urine above 2%.	Blood urea below 40%.	Urine urea above 2%.	Urine urea concentration below 2%, with diuresis.
Mania	13	5	12	5	2	Dementia præcox	22	7	17	8	9
G.P.I.	3	3	3	3	0	Confused states ...	16	8	12	11	2
Insanity c. epilepsy	7	5	7	5	1						
Melancholia... ...	22	12	15	15	3	Totals	83	40	66	47	17

TABLE IV.—*Cases of Kidney Disease.*

Blood urea above 40 mg. per cent. and urine urea concentration below 2 per cent.

Name.	Age and sex.	Urine conc. test. Amount of urine (c.cm.). 1st hour.	2nd hour.	Percentage conc. urea in 2nd hour.	Specific gravity.	Reaction.	Albumin.	Blood urea %	Total amount urine 24 hours (c.cm.).	Urea percentage.	Total amount urea in grammes.	Total ammonia in grammes.	Urea nitrogen and amm. nit. ratio.	Mental state.	Physical state, &c.
J. E.	76, F.	250	96	1·03	1010	A	0	54	—	—	—	—	—	Melancholia.	Fair health; no symptoms. S.B.P. 220 mm. Hypertrophy left ventricle
J. M.	60, M.	35	60	1·43	1017	A	Tr.	43	600	3·09	18·54	0·599	17	Melancholia with confusion.	Fair health; marked arterio-sclerosis. S. B. P. 160 mm. Slight degree of acidosis.
H. C.	58, F.	145	165	0·87	1010	alk.	0	19	—	—	—	—	—	Recurrent mania during attack of excitement.	Fair health; general arterio-sclerosis. S.B.P. 130 mm.
M. G.	62, F.	46	48	1·46	1018	A	0	11	—	—	—	—	—	Mania with confusion.	Fair health; arterio-sclerosis. S.B.P. 140 mm.

Remarks.—All cases of interstitial nephritis. It is noteworthy that only two cases show a blood concentration over 40 mg. per cent.—one a normal blood concentration and one subnormal.

TABLE V.—*Cases without Kidney Disease.*

Blood urea above 40 mg. per cent. and urine urea concentration below 2 per cent.

C. J.	28, M.	—	135	1·68	1015	A	0	48	1230	1·5	18·45	0·702	14	Dementia præcox.	Fair health. S.B.P. 108 mm.*
C. H.	17, M.	285	80	1·93	1018	A	0	59	1560	1·21	18·87	0·912	10	,, ,,	Fair health. S.B.P. 136 mm. A marked degree of acidosis.
S. R.	25, M.	60	90	1·2	1015	A	0	46	—	—	—	—	—	Melancholia.	Good health. S.B.P. 140 mm.
T. E.	31, M.	50	70	1·14	1015	A	0	52	—	—	—	—	—	Mania with confusion.	Fair health. S.B.P. 110 mm.
J. B.	21, M.	295	185	1·85	1016	A	0	50	690	4·0	27·6	0·830	15	Melancholia. ? Dementia præcox.	Fair health. Slight degree of acidosis. S.B.P. 145 mm.
K. J.	23, M.	210	50	1·01	1015	A	0	42	—	—	—	—	—	,, ,,	Good health. S.B.P. 135 mm.

* The U and N ratio signifies that a moderate degree of acidosis was present.

Remarks.—The above six cases should be regarded as cases of renal inefficiency according to the urea concentration tests. It is noteworthy that in three of the cases where the urea N and ammonia N ratio has been determined a condition of acidosis is found to coexist; that they are all adolescents with ages ranging from 17 to 31 years; that the total urea output is within normal limits in each case examined; that dementia præcox is well established in two cases and in the early stages in two others, in all of whom the systolic blood pressure is above normal.

TABLE VI.—*Cases without Kidney Disease.*

Blood urea below 15 per cent. and urine urea concentration below 2 per cent.

Name.	Age and sex.	Urine conc. test. Amounts. 1st hour.	2nd hour.	Urea percentage in 2nd hour.	Urine— Sp. gr.	Reaction.	Albumin	Blood urea %	Mental state.	Physical state, &c.
M. D.	45, F.	90	190	1·06	1010	Alk.	0	15	Melancholia.	Good health. S.B.P. 130.
A. S.	30, F.	320	115	1·42	1014	A	0	11	Dementia præcox.	,, ,, 126.
G. E.	37, F.	175	175	1·09	1010	A	0	12	Melancholia.	Fair health. S.B.P. 110.
C. G.	28, M.	415	160	1·5	1016	A	0	15	Dementia præcox.	Good health. S.B.P. 114.
E. H.	35, F.	70	30	1·6	1020	A	0	9	,, ,,	,, ,, 118.
W. G.	26, F.	285	130	1·2	1010	A	0	14	,, ,,	,, ,, 125.
W. G. N.	32, M.	150	135	1·21	1021	A	0	10	,, ,,	Moderate health. S.B.P. 112
A. M.	31, M.	290	160	1·5	1015	A	0	12	Confusional insanity.	Fair health. Alcoholism. S.B.P. 118.

Remarks.—The cases of dementia præcox in the above table show a low blood concentration and a low urine concentration. Diuresis is present in all except one case. The low blood and urine concentrations may be due to a lower rate of metabolism, especially that of the protein moiety. This is noteworthy in connexion with dementia præcox.

TABLE VII.—*Dementia Præcox.*

The presence of kidney disease has been excluded by clinical and other available methods.

Name.	Age.	Urea in urine conc. test.	Diuresis present.	Urea percentage in blood.	Total urea output in grammes.	Urea and ammonia nitrogen ratio.	Total amount of urine in 24 hours.	Percentage urea concentration in 24 hours' specimen.
J. B.	21	1·8	No.	50	27·5	15	690	4"
L. R. J.	22	2·6	No.	25	29·5	11	1140	2·59
C. H.	17	1·93	Yes.	59	18·8	10	1560	1·21
C. J.	28	1·68	No.	48	18·4	14	1230	1·5
T. R. R.	26	1·3	Yes.	23	20·2	10	1620	1·25
D. M.	24	3·03	No.	18	17·6	12	1350	1·31
E. G. L.	23	4·5	No.	18	24·8	10	1590	1·56
C. C.	24	1·7	Yes.	17	17·5	10	1000	1·7

* An early and doubtful case of dementia præcox.

Remarks.—All the cases are adolescents. The total daily urea output is within normal limits, but there is an increase in the total ammonia excreted. The urea nitrogen and ammonia nitrogen ratio is normal and points to the presence of a state of acidosis. There is a low urine urea concentration in the urine excreted in the 24 hours as well as in that of the concentration test associated with polyuria and diuresis. The urea concentration in the blood is variable.

is an unreliable guide as to the state of health of the kidneys.

(2) The urea concentration in the urine gives more reliable information. A low concentration should be regarded only as a confirmation of other evidence.

(3) Anomalous results, both as regards urea concentration in blood and urine, apart from kidney disease, are as demonstrable by available methods common in the psychoses.

(4) In dementia præcox a low concentration of urea in the urine is found to coexist with polyuria and a state of acidosis.

A CASE OF OSTEITIS FIBROSA.

TREATED BY RESECTION OF FOUR INCHES OF HUMERUS AND INSERTION OF BOILED BEEF-BONE GRAFT.[1]

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IT is an accepted fact that for bridging wide gaps in adult bones it is necessary to make use of autogenous bone grafts, but the work of Gallie and Robertson[2] showed that for short gaps, even in healthy bones, boiled grafts might be used with the expectation of the gap being ultimately bridged by living bone. König's work[3] on the use of massive ivory grafts showed that these became firmly united to the living bone, the surface of the graft being soon pitted by ingrowth of granulation tissue. Barth[4] showed many years ago that dead bone and ivory could heal into the tissues and become incorporated with or substituted by the living bone.

In children the conditions differ from those of adult bone, especially when the gap is situated near the growing end of the diaphysis, and when proliferation of subperiosteal bone cells is already present as a result of inflammation or injury; in such cases it is reasonable to expect that a dead graft will be as efficient as a living autogenous one, for it becomes rapidly united to the living bone, and surrounded by new bone from the periosteum.

In the case described below use was made of a boiled beef-bone graft to fill a gap of four inches left by resection of the upper part of the humerus for osteitis fibrosa.

FIG. 1.—Showing localised rarefaction and expansion, with fracture. (Nov. 5th, 1920.)

FIG. 2.—One month after operation. Beef-bone graft united to humerus; much new bone from periosteum on the inner aspect, and small areas of new bone externally. (Jan. 6th, 1921.)

FIG. 3.—Three and a half months after operation. Showing dense new bone surrounding the graft. (March 24th, 1921

The notes of the case are as follows:—

A. C., a girl of 10 years and 9 months, admitted to Paddington Green Children's Hospital on Nov. 25th, 1920.

History.—Four days previously she fell prone, and the right arm became useless. In February, 1919, she had been admitted to another hospital for pain in the arm following a fall; X rays showed a localised area of rarefaction in the upper part of the humerus. An operation was performed, the bone being opened, and an area of soft tissue in its interior was removed by the curette. Microscopic examination showed this to be fibrous tissue.

Family history.—One child died from bronchopneumonia, another from convulsions. Two others are alive and healthy. No miscarriages. No other family illness.

Condition on admission.—Signs of fracture (pain, crepitus, slight deformity) of the upper end of the right humerus, with little displacement. X rays (Fig. 1) showed a rarefied and expanded area in upper third of humerus, with pathological fracture.

Nov. 29th, 1920: Plaster case made in two pieces, including arm, forearm, and thorax, the arm being in a position of abduction flexion and external rotation.

Operation (Dec. 7th).—Six-inch curved incision at the anterior margin of the deltoid. The bone was extensively destroyed and replaced by fibrous tissue, there being a thin shell of compact bone (fractured) postero-internally; the periosteum was absent anteriorly for one-third of the circumference of the bone, the muscles forming a pseudo-capsule for the fibrous mass. The bone was divided above and below the diseased part, after the remaining periosteum had been separated, four inches of the humerus being removed. The beef-bone graft was then inserted, its lower peg extending into the medulla of the lower fragment of humerus, its upper end being wedged into the cancellous bone above. This graft had been cut from the tibia of an ox and was macerated and boiled for about 48 hours; it consisted of compact bone, and was 5 in. long, 7 8 in. wide, 1 3 in. thick; it was shaped by an Albee's saw and by filing, and drilled by multiple holes transversely, and also longitudinally at each extremity. The muscles and periosteum were sutured round the graft with catgut, and the wound closed without drainage; the plaster cast was then reapplied. On the 14th stitches removed, primary healing. From the end of the third week the plaster was removed each day to allow of careful active movements; the bone appeared to be firmly united within three weeks of the operation. The patient left hospital in the plaster on Jan. 5th, 1921.

Jan. 6th: X rays showed considerable formation of new bone on the inner aspect and small areas of new bone

[1] Shown at meeting of Clinical Section of the Royal Society of Medicine, April 8th, 1921.
[2] Brit. Journal of Surg., October, 1919, vol. vii., No. 26, p. 211.
[3] Beitr. z. klin. Chir., 1913, xlii., p. 353.
[4] Arch. f. klin. Chir., 1893, xlvi., p. 409.

on the outer aspect of the graft, having apparently extended through the drill-holes (Fig. 2). On the 10th all passive movements normal; active abduction slightly diminished, other active movements normal. On the 23rd plaster case finally discarded, since which date no appliance has been used, the patient being allowed to employ the arm normally.

Feb. 4th: From this date the condition has been as it is now, with firm union, no wasting, full abduction, full range of rotation, with slight excess of external rotation, and a similar slight degree of diminution of internal rotation. The limb was lightly massaged twice a week for five weeks, commencing on Jan. 23rd.

X ray photographs taken on Jan. 27th, Feb. 24th, and March 24th (Fig. 3) show gradual increase of new bone, of increasing density, surrounding the graft, and apparently filling the drill-holes. Histological examination of the specimen showed the typical appearances of osteitis fibrosa.

Report on Pathological Tissue Removed at Operation.

Dr. H. Perkins, pathologist to the hospital, has kindly provided a report on the specimen, which he also submitted to Dr. E. H. Kettle, of St. Mary's Hospital, for confirmation.

"The continuity of the bone shaft is lost in an irregular mass of new tissue, which is pink in colour, of great firmness, and not very vascular; this tissue occludes the medullary canal, and no cysts are present. Histologically, the mass consists chiefly of firm fibrous tissue in which there are very few blood-vessels. In some parts a more cellular growth is found, consisting chiefly of spindle-shaped cells; the transition from spindle-shaped cells to firm fibrous tissue can be observed in the section. With the spindle cells are many multinucleate giant cells, but their character does not suggest malignancy."

Summary.

The method seems to the author to present the following advantages:—

1. It was not necessary to interfere with another bone of the patient for provision of the graft; fracture of the tibia has in several cases followed long after the removal of bone for a graft.

2. The beef-bone graft was much stronger than any autogenous graft that could have been used, and the function of the arm was fully restored in seven weeks; at this time all retentive apparatus was discarded, and from that time the limb has been used normally.

3. The avoidance of prolonged immobilisation allowed the muscles to recover their size and function very rapidly, and prolonged treatment by massage, &c., was avoided also.

In fact, the patient has merely been kept under observation, and has not had treatment (except four weeks' massage) since seven weeks from the date of the operation.

PROFESSIONAL AND BUSINESS WOMEN'S HOSPITAL LEAGUE.—The annual report of this League for the year ending Dec. 31st, 1920, states that the League has steadily increased in numbers and that the general position is very satisfactory. The League, to which we have already referred (THE LANCET, 1920, ii., 1266), was founded in 1913 to make provision in severe sickness for women who earn their living in professional and business callings. On July 1st the committee concluded a contract with the St. Andrew's Hospital, Dollis Hill, on similar lines to that in force with the South London Hospital, by which accommodation is provided in a private ward for ordinary members of the League. Special grants are paid for treatment on behalf of provincial members who are unable to come to either of these hospitals for treatment, and occasionally for other cases who for some sound reason appear unable to avail themselves of the benefits arranged in the hospitals. Since the ordinary members subscription of 5s. per annum cannot entirely pay for the benefits offered, the League is still to a great extent dependent on the subscriptions of vice-presidents and hon. members, who receive no benefits. It is hoped that those who employ professional or business women will subscribe. County committees are being formed to enlist sympathisers and members, to collect money, and generally to aid the League. Owing to the enterprise of Mrs. W. S. Pedley, of Eastbourne, a branch in Sussex has already been started. The president of the League is Lady St. Cyres. Further information can be obtained from the Secretary, Miss Mildred Ransom, at the Registered Office of the League, 195-197, Edgware-road, London, W. 2, to whom donations may also be sent.

A NOTE ON EXTERNAL DISLOCATION OF THE PATELLA.

BY RUSSELL F. MADDREN, M.D.

(From the Department of Experimental Surgery, New York University, U.S.A.)

THE bibliography of patella dislocation has become so extensive that the report of a single additional case would not appear justifiable unless it presented unusual features. As long ago as 1836 Malgaigne was able to collect 25 examples of patella luxations, and at present two or three cases apply every year to the average metropolitan hospital. Most of these patients, however, are adolescent females, whose patellæ occasionally slip out over the external epicondylar ridge because they suffer from genu valgum or some developmental deformity of their lower extremities. The multiplicity of operations that have been devised to correct this lesion suggests that surgical treatment is not invariably satisfactory.

Possession of a patella is "more a luxury than a necessity," as Hood demonstrated; its absence only affects an individual unfavourably if the extensor mechanism of his leg has become relaxed by disease or injury. One calls to mind that the kangaroo has no bony patellæ. In my patient the location of his right patella precluded its acting as a fulcrum, but, notwithstanding this, locomotion was perfect.

The Case Described.

In March, 1920, J. A., male, aged 31, was sent to me for physical examination preliminary to employment. Aside from the fact that his right patella was displaced externally, no abnormality was discovered. His general condition and muscular development were excellent. He demonstrated that he could run up and down the examining room doing

External dislocation of the patella.

an "about-face" when bidden without the slightest limping, hesitation, or embarrassment. He was passed as fit. During the ensuing three months, or until he left the company's service and was lost to sight, this man, whose work required him to wheel a barrow all day, was repeatedly examined by others as well as by the writer. No amount of manipulation would replace his dislocated patella in the trochlea—which was not as in Schaffer's case, the site of an exostosis. Both patellæ were apparently equal in size. The patient was quite certain that his right leg had never been injured and insisted that it had been in its present condition as long as he could remember. His mother had told him that the "lump" on the outer side of his knee had "always" been there. None of his relatives had similar deformities. His finger-nails were normal.

This was not a case of the familial type described by Little and by Wirth. There was no other bony deformity of his lower extremities.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

WAR SECTION.

INFLUENZA IN THE NAVY.

A MEETING of this section of the Royal Society of Medicine was held on May 9th, Surgeon Rear-Admiral Sir ROBERT HILL, the President, in the chair.

Surgeon-Commander S. F. DUDLEY read a paper detailing his observations on the influenza pandemic of 1918 and 1919 as seen in the Navy. He attributed his occasional failures to isolate the *B. influenzæ* from influenza patients entirely to faulty technique, but considered that the reported absence of this organism from certain groups of cases may have been due to a secondary organism which had gained access as the result of a primary infection with *B. influenzæ*. He stated that during the past two years a carrier-rate of about 50 per cent. was constantly found for *B. influenzæ* among healthy sailors, and the percentage of positive results showed no relation to influenza prevalence. The three main factors relating to the nature and severity of epidemics were infectivity, virulence, and susceptibility. The greater the degree of infectivity in a parasite, the greater was its chance of infecting fresh hosts; while virulence was really a handicap to the parasite, as it limited the opportunities for multiplication and dispersal of the species beyond a single host, since corpses had few chances of disseminating diseases. On the other hand, the carrier, who was really the mildest of cases, frequently distributes his parasites. Also the less virulent strains of an organism generally stimulated less resistance on the part of the host, and therefore were more likely to succeed in adapting themselves to their environment. A parasite of sufficient infectivity might appear (possibly by the mutation of a less infective, but similar organism) and spread through a susceptible population as an epidemic. As the population gradually acquired a higher and higher degree of immunity, the more infectious strains of the parasite survived, and the more virulent strains become eliminated, ultimately resulting in a multitude of so-called carriers. The handicap of virulence, however, might not be felt as long as susceptible hosts were sufficiently numerous, and in the earliest days of an epidemic infectivity and virulence might increase together. Secondary organisms associated with the primary agent of influenza were probably the chief cause of its variable symptomatology and virulence, and were usually present from the outset of the disease, suggesting that influenza might always be a compound infection, and that mutualism and symbiosis have a share in the ætiology.

Statistics of the pandemic as it affected ships in the Royal Navy illustrated some points better than figures obtained ashore. In those ships that experienced two waves in 1918, the attack-rate in each wave was roughly 25 per cent.—that is, 50 per cent. were attacked in the year. The latter figure was the same as the attack-rate of those ships which were only attacked in the autumn, after they had completely escaped the earlier wave. The simplest explanation was that in the spring of 1918 only a quarter of a ship's company were susceptible to the prevalent strain of influenza germ. After a while it gained in infectivity, so that in the autumn, on its return, influenza was able to infect a further quarter of the men whose immunity had been good enough to withstand the spring type.

The men who had had influenza in the spring had generally acquired sufficient immunity to resist the more infectious autumn type, while in the ships attacked for the first time, where there had been no immunising previous outbreak, 50 per cent. of the crew at once fell victims. This year (1921) there was an outbreak of influenza among the ships at Portsmouth, the highest attack-rate being 7 per cent.; thus this year it seemed probable that 93 per cent. of the sailors were naturally immune, or had acquired immunity. In a ship the population was so dense and local migration so great that it might be assumed that once a ship was attacked by epidemic influenza, every susceptible on board would get the opportunity of obtaining an effective dose of the specific germ.

There were two types of epidemics in ships attacked in the autumn of 1918. In one the attack-rate was 58 per cent. with many severe pulmonary cases, and 7·5 per cent. case mortality, the predominant organism being a "Gram-positive diplococcus." The other had an attack-rate of 51 per cent. with no deaths or complications of any kind, and influenza-like bacilli were numerous in the sputa. The higher mortality in the first example was probably due to the secondary Gram-positive coccus. The intervals that elapsed between the crests of the two waves of the 1918 to 1919 pandemic was in general longer than that observed ashore in England; for example, 27 weeks elapsed in H.M.S. *Revenge*, 20 in H.M.S. *Royal Sovereign*, and only 16 in London.

Surgeon-Commander Dudley concluded by stating that naval experience and statistics had convinced him that the only sound way of preventing morbidity and mortality in a sea-going fleet was the early and thorough use of a vaccine, combined with the most absolute isolation of infected ships.

Discussion.

The PRESIDENT drew attention to the similarity of the pandemic occurring in 1889 and 1890 to that of 1918 and 1919.

Surgeon Rear-Admiral P. W. BASSETT-SMITH considered that the primary organism made the lung in such a condition as to favour secondary infections. He emphasised the fact that the first wave was mild as compared with the second wave, which was severe. He considered that the first wave conferred considerable immunity in the second wave, and that a mixed vaccine was the most efficacious one in diminishing mortality. In order to ward off an epidemic, immunisation by vaccination should be undertaken widely and early.

Lieutenant-Colonel BERNARD E. MYERS said that in New Zealand dark-skinned persons were first attacked, the native-born New Zealander was the next in the order of attack, while the home-born New Zealander appeared the least susceptible. He considered that a mixed vaccine, containing six or seven varieties of organisms produced a high degree of immunity, that two inoculations were sufficient, and that these should be repeated every six months in order to maintain the immunity.

Squadron-Leader H. E. WHITTINGHAM said that there were three types of influenza attack, as estimated by the leucocyte count. In the first type there was a primary leucopenia, followed later by a leucocytosis; in the second type a leucocytosis was found throughout, while in the third the primary leucopenia persisted. In the speaker's experience this third persistent leucopenic type almost invariably ended fatally.

SECTION OF OPHTHALMOLOGY.

A MEETING of this section of the Royal Society of Medicine was held on May 13th, Dr. JAMES TAYLOR, the President, being in the chair.

Extreme Choroidal Atrophy in High Myopia.

Dr. R. L. REA showed a case of this description in which the fundus was very well seen by Dr. Rayner Batten's instrument. There was a myopia of 30 D. Until he used this apparatus he had had great difficulty in seeing the fine changes in these high myopic fundi; he now had no such trouble.

Treatment of Lacrymal Obstruction.

Dr. D. LEIGHTON DAVIES read a paper entitled "Lacrymal Obstruction: Results of the Anastomotic Method of Treatment (Toti)." He described the operation which Toti was the first to perform for lacrymal obstruction, and set out the circumstances and conditions under which it should be carried out. He had performed the operation 56 times. In 36 patients a complete cure resulted—i.e., there was no epiphora and the canaliculus could be syringed through. In 10 it was partially successful—i.e., the patient was no longer troubled with watering in the eye, yet fluid could not be got through the channel. In 10 the procedure was a failure, for watering of the eye still occurred and there was complete obstruction of the passage. Partial failures were due to contraction of the new opening. It was remarkable that, though an opening was made large enough to admit the tip of the forefinger, this had closed again or become obstructed in three months. This subsequent contraction constituted the weak point in the operation. He had thought it might be due to his having excised too much of the wall of the sac; yet some of the obstructions were not due to the contractions which took place round the mucous membrane, but to a contraction of the inner end of the canaliculus. Every case he had dealt with by operation had been satisfactory for three or four weeks; it was only after this period that contraction began to take place. In comparing this operation with that in which the intranasal route was chosen, he said the latter could have only two features urged in its favour: (1) that it could be done without causing an external wound; (2) that it did not disturb the relations of the sac as much as did the external operation. Against these, however, were the facts that the intranasal operation had to be carried out in a very restricted space, so that it was difficult for the surgeon to see what he was doing; secondly, it often required a preliminary operation to deal with a deflected septum or an enlarged turbinal. It was, in addition, difficult to get through the nasal process of the superior maxilla. Most of the statistics published on Toti's operation gave between 60 per cent. and 70 per cent. of successes. If a case was successful at the end of four months, he felt it would be permanently so; the scar became invisible in two months.

Discussion.—Mr. A. W. ORMOND said he also had found these cases to be unsatisfactory. His experience had been that the less he did the better the result. When pressing over the sac, if there was much muco-pus present, he usually passed a somewhat small probe to ascertain if there was real organic obstruction, and if that was discovered he did no further probing. Many of these cases he regarded as due to strictures which were potential—i.e., caused by inflammation of the mucous membrane and the contiguity, possibly the adhesion, of the walls of the canaliculus to each other. He then instructed the patient to express the sac contents and instil antiseptic drops, such as chloride of mercury and sulphate of zinc. Usually at the end of six weeks of such treatment the discharge had changed from purulent to simply mucoid. If there was still watering and much complaint was made he advised removal of the sac.

Mr. MALCOLM L. HEPBURN thought that in some of these cases there was definite thickening not only of the tissues round the sac, but of bone also.

Mr. W. H. MCMULLEN said the condition in children differed from that in adults in regard to the outlook. His experience had been that the majority of cases due to congenital obstruction opened up spontaneouly in the course of a few weeks or months if the sac contents were expressed and the part was kept moderately clean. When met with in later childhood he had found the treatment of the condition very unsatisfactory; chronic lacrymal dacryo-cystitis in children aged 4 years mostly needed excision of the sac.

Dr. LEIGHTON DAVIES, in reply, said he did not advise the operation unless the patient was very much troubled by the epiphora; he first adopted the means spoken of by Mr. Ormond. Some, however, were so worried by the constant "tearing" that they were willing to submit to anything which promised relief; these he operated upon. He never pressed the operation, because he was not in a position to guarantee success. He believed the so-called "potential" strictures always became organic ones ultimately, though he did not think they became bony. He had not found one case in which this was so in over a thousand dried skull specimens; therefore he thought the stricture was always confined to the soft tissues. He did not think a surgeon was justified in doing Toti's operation on a person under 16 years of age, as it was wrong to interfere with the parts in a growing child. Neither, unless the condition was very troublesome, did he do the operation on old people, because their expectation of life was not very great, and the inconvenience should be borne with.

Aphakia in a Human Embryo.

Miss IDA C. MANN showed a series of remarkable skiagrams and diagrams of a specimen of aphakia in a human embryo of five or six weeks.

The PRESIDENT, Mr. LESLIE J. PATON, and Mr. R. AFFLECK GREEVES congratulated Miss Mann on her exhibit, and the last-named said that in all the congenitally abnormal eyes he had examined a lens or lens capsule was present; he had never seen a case without a lens.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.

NAVAL, MILITARY, AND AIR FORCE HYGIENE GROUP.

DEMONSTRATION OF SANITARY APPLIANCES.

A MEETING of this group of the Society of M.O.H. was held on May 6th at the Royal Army Medical College, where a demonstration of sanitary appliances of interest to health officers had been arranged. Lieut.-Colonel H. R. KENWOOD, the President, occupied the chair.

Sir JOHN GOODWIN welcomed the group to the College and to the demonstration which had been prepared for their benefit.

The PRESIDENT spoke of the healthy and happy coöperation which the group by its existence had sustained between medical officers in the services and those in civil employ. The demonstration, organised by the professors of hygiene, tropical medicine, and pathology, was given in the theatre, museum, and laboratories of the R.A.M. College. All exhibits had printed explanatory cards attached and were, moreover, grouped in sections, each in charge of a R.A.M.C. officer, who gave a continuous series of short demonstrations. The sections covered almost the entire range of preventive medicine in its relation to military service under all climatic conditions.

Description of Exhibits.

In the first section there was shown apparatus whereby the energy expenditure of soldiers working under various conditions is estimated, in order to determine the precise food requirements for each stage of training and phase of active operations. An apparatus for ascertaining the effect of load on static equilibrium should be of great value in the prevention of unnecessary fatigue. A fabric impervious to water but freely permeable by air currents was shown as an ideal material for service dress.

The next section, of historical interest, showed all stages in the evolution of means of protection against toxic gases in the field, culminating in the production of the box-respirator.

The section illustrating the life-histories of insect vectors of disease showed the relationship of the mosquito to malaria, while specimens of mosquitoes, blood-sucking flies, lice, fleas, and ticks were so mounted as to facilitate detailed examination. A collection of photographs showed a variety of mosquito-breeding areas, each constituting an especially difficult problem of effective treatment, and each bracketed with its parallel photograph showing the result of the treatment adopted. These afforded striking evidence of the amount of work involved in malaria prophylaxis.

In the section devoted to the prophylaxis and treatment of venereal disease in the army the lethal effect of collosol on living specimens of *Spirochæta pallida* could be followed under the microscope, and the coruscations of the argentum collosol was the subject of an ultra-microscopic demonstration. Photographs from various theatres of war illustrated the clinical appearances of primary lesions of non-genital distribution. The prophylactic packets used in our own forces and those of other nationalities were on view. In other sections demonstrations illustrating the ætiology and pathology of influenza, malaria, Mediterranean fever, kala-azar, oriental sore, dysentery, plague, trypanosomiasis, schistosomiasis, &c., were given. Cultural forms of leishmania and trypanosomes were well shown by dark-ground illumination. The methods of preparation of typhoid-paratyphoid vaccine were illustrated in detail in conjunction with data of the results obtained by it during the recent war. An exhibit of microscopic projection apparatus represented the most recent developments of appliances for instructional purposes. The remaining sections of the exhibition dealt with disinfecting apparatus, the work of the chemical and physical laboratories, field sanitation and army rations.

The Sack Disinfector.

The "sack disinfector" was shown as an apparatus which disinfects and disinfests clothing rapidly and efficiently. It consists of a large steam-tight sack suspended mouth downwards. Clothing is hung from hooks on a detachable wooden disc, which is then drawn by a pulley into the interior of the inverted sack, the mouth of which is partially closed by a purse-string. Steam is generated by combustion of oil in a powerful pressure-stove beneath a small copper boiler, and is led through a flexible tube connected to the upper end of the inverted sack. When a charge of ten suits was placed in the sack, steam emerged from the down-turned mouth after 3½ minutes and thus indicated that disinfection had been completed. Lice placed amongst the articles were found to be killed, and ingenious chemical thermometers placed in the pockets of the garments all indicated that a uniform temperature of 100° C. had been reached throughout the whole charge. The disc having been removed from the sack, the clothing is shaken well and dries rapidly. A portable form of disinfecting apparatus was also shown. It can be carried by bicycle, and can safely be used in the homes of the people, the boiler being placed over the kitchen fire and the sack hung from a support wedged between the door and its frame.

A new departure in the treatment of sullage-water was seen in action and appeared to be giving most satisfactory results, clarification being effected by electrolysis. Amongst the other exhibits was also a Soxhlet for extraction of fat, modified by a device for electric heating. A collection of apparatus for recording temperatures in closed chambers, and a collection of rat poisons were on view.

In the museum were models of a large variety of sanitary appliances used in the field during the war. Another adjacent section showed the "iron rations" of many armies, and the stages of evolution of our own. Samples of various special articles of food (nut-food, anti-scorbutics, &c.) introduced into the ration carried by the members of Shackleton's antarctic expedition on their dash for the South Pole were shown.

The demonstration thus provided an interesting variety of exhibits presented in a convenient form for examination and rapid apprehension.

Intending members of this group of the Society of Medical Officers of Health are invited to communicate with the hon. secretary, Major W. N. W. Kennedy, Town Hall, Croydon.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

OBSTETRICAL SECTION.

A MEETING of this section was held on April 29th, Dr. E. HASTINGS TWEEDY, the President, being in the chair.

Dr. R. E. TOTTENHAM showed a new type of Pelvimeter.

Primary Carcinoma of the Vagina.

Dr. GIBBON FITZGIBBON (Master of the Rotunda) showed a specimen of Primary Carcinoma of the Vagina from a married woman, aged 42, a VII.-para. Last pregnancy, four years ago, was normal. Menses were regular and normal. She was quite well up to two months ago, when slight bleeding from the vagina started and continued. On examination the vulva and perineum were quite healthy. From the right lateral fornix of the vagina there was an ulceration extending slightly on to the posterior wall and down the lateral wall to about an inch and a quarter from the hymen. The ulcer looked very clean, the surface a little irregular and soft, and the edges fairly sharp. There was no evidence of rectal or bladder involvement. The ulcer ran close up to the cervix, but did not encroach on the mucous membrane of it. Per rectum a hard nodule could be felt under the ulcer extending out towards the pelvic wall but mobile. The surface of the ulcer was removed with the curette, and some pieces of the edge were cut away for examination. The pathological report revealed definite cancerous growth showing dense masses of cells.

Operation.—First by the abdomen the ordinary lines of a Wertheim's hysterectomy were carried out until the whole of the vaginal fornices were quite freed. The internal iliac vessels were cleaned and tied at their origins. The patient was then put into the lithotomy position and the vagina divided just inside the hymen all round and separated up, taking as much of the tissue in the ischio-rectal fossæ as possible until the detached upper part was reached, when the whole mass of the vagina and uterus was removed through the vulva. The edges of the vulva were fixed with a few stitches, and the rest of the operation was done by the abdomen. The pelvic peritoneum was closed over a gauze packing. The patient showed a deal of shock, but responded well to a coffee enema followed by small saline enemas during the next 24 hours, and has made an uninterrupted recovery, the abdomen healing perfectly.

A few days before operating on this case Dr. Fitzgibbon operated on another in which the cancer was also primary in the vagina and situated in the lower half, just coming down to the level of the hymen. There was a mass extending out to the ischio-rectal fossa and a hard ring round the vagina, but the ulceration was only lateral. In this case Dr. Fitzgibbon removed the whole vagina from the lesser labium, the edge of the perineum, and the external meatus of the urethra up to the vaginal fornices, and taking the vaginal portion of the cervix. Of the two operations he thought the former was the easier. There was less hæmorrhage owing to the internal iliac vessels having been tied, and the removal of parametrium above the fornices was much more complete and simpler. If he had to operate on cancer of the vagina again he would do the operation—including the removal of the uterus—in three stages, as in this case. It was surprising how little arterial bleeding occurred, only two or

three small vessels requiring to be tied, but there was rather profuse venous bleeding for a time, and this was avoided in the case with hysterectomy.

Drs. BETHEL SOLOMONS, D. G. MADILL, and the PRESIDENT spoke, and Dr. FITZGIBBON replied.

Some Notes on the Fibrous and Muscular Attachments of the Vagina.

Dr. LOUIS CASSIDY read a paper on the fibrous and muscular attachments of the vagina. In the course of his communication he showed (by various lantern-slides) that the lower two-thirds of the lateral walls of the vagina are in close apposition with the levatores ani muscles. Interposed between the lateral walls of the vagina and these muscles is a distinct layer of fascia—a portion of the visceral layer of the pelvic fascia—which gains a very definite attachment to the walls of the vagina. This layer is clearly demonstrable, and is intimately blended with the fasciculi of the levatores ani muscles. When followed forwards immediately below the neck of the bladder this fascia will be found to be continuous with the pubo-vesical ligaments; whilst behind it passes into the fascia surrounding the rectum. The surface of this layer of the fascia which rests upon the levatores ani sends prolongations into the muscle to blend with its sheath, thereby indirectly supporting the vagina. The anterior and posterior fascial supports of the vagina resolve themselves into the attachments between the fibrous covering of the posterior wall of the urethra and the anterior fibrous sheath of the rectum behind. The attachment between the wall of the urethra and vagina is a very close one, the structures being morphologically continuous, and is associated with the presence of the dense mass of fibrous tissue which in this region occupies the space left by the disappearance of the female prostate. It is impossible to separate the two structures in their lower two-thirds; the knife must be used. The union of the lower three-fourths with the rectum and anal canal is much less intimate, and permits of easy separation. This relationship between the rectum and vagina is much strengthened at the junction of the rectum and anal canal by the presence of the perineal body. This structure is a wedge-shaped mass consisting of fibro-muscular tissue, and is about one inch in depth, the base of the wedge lying at the skin surface. The vagina pierces the two layers of the triangular ligament and consequently receives firm support from this structure. The muscular attachments of the vagina consist solely of the levatores ani. A transverse section, 4 mm. thick, through the pelvis of a female child, aged 19 months, and taken through the middle of the true pelvis, demonstrates the attachments of fibres of the levatores ani muscles to the lateral walls of the vagina. This relationship is denied by such eminent authorities as Halban and Cruveilher. In conclusion, Dr. Cassidy was convinced that the prevention of a hernial protrusion of the anterior and posterior walls of the vagina will depend on the lateral support it receives from the pelvic fascia and the integrity of the perineal body. He considers this latter structure of paramount importance in the mechanical support of the female pelvic diaphragm. There was one other point to which attention might be drawn—viz., the presence of the transversalis colli, or Mackenrodt's ligaments. These structures can be readily recognised in transverse section through the pelvis of a young female child. That these ligaments do very materially support the upper third of the vagina there cannot be much doubt.

Discussion.

Dr. FITZGIBBON agreed with Dr. Cassidy about the value of the pelvic fascia. Referring to the parietal and visceral layers, he thought that anatomists did not go far enough. He was of opinion that the former is merely the covering of the levator ani muscle. The actual supports of the vagina were well shown by Dr. Cassidy. Dr. Fitzgibbon thought there was just as much fascia round the parametrium as in Mackenrodt's ligaments. The parametrium was all muscular, and contained very little fascia, and this was the real support of the vagina.

Dr. BETHEL SOLOMONS was greatly struck by the fact that in Dr. Cassidy's ardent research it had been found that Mackenrodt's ligaments were not the only supports of the vagina. He believed that in further research Dr. Cassidy would find that Mackenrodt's ligaments were probably the most important but not the only supports of the pelvic viscera. The fact that when these ligaments were cut the uterus descended did not prove that they were its only supports, any more than the falling of a body when one leg is removed indicates that it has been supported entirely by the other leg. Dr. Solomons asked Dr. Cassidy what constituted the pillars which were so useful in acting as supports for the bladder in an operation for the cure of cystocele? Did he consider them to be a portion of the pubo-coccygeus muscle with or without fascia, or possibly the detrusor muscle of the bladder?

The PRESIDENT regretted that Dr. Cassidy had not gone further, and demonstrated the attachments of the uterus, but hoped he would do so on a future occasion. In his (the President's) opinion, these fibrous attachments are the supports of the uterus as well as of the vagina. The Master of the Rotunda was right in saying that the strands of fibrous tissue in the pelvis run in every direction, and different names—Mackenrodt's ligaments, utero-sacral ligaments, &c.—have been given to different bundles of these. The theory of the pelvic fascia was fascinating, but it was not "a pelvic fascia." He believed that the uterus is the origin of these strands, which grow out from it in all directions, and they might fitly be described as "uterine tendons." These tendons or ligaments contain muscle, and are under the control of the uterus and, he believed, are its sole support.

Dr. CASSIDY briefly replied.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

THE ANNUAL CONGRESS.

THE Annual Congress of the Society was held on May 5th, 6th, and 7th, at the Royal Society of Medicine, and at St. Thomas's Hospital, the event at the latter institution being a demonstration of clinical cases and of apparatus. The chair was occupied throughout by Mr. J. HERBERT FISHER.

Presidential Address: The Personal Equation.

The PRESIDENT, in the course of his address, said the complete ophthalmologist did not, and could not, exist. The subject was wide as the heavens, deep as the ocean; to comprehend ophthalmic science as it now exists it was necessary to enlist as allies the mathematician, the physicist, the chemist, the physiologist, the anatomist, the physician, the surgeon, the urologist, the rhinologist, the dentist, the gynæcologist, the neurologist, the radiologist, the pathologist, the bacteriologist; and within the specialty there was room for every man to exploit to the full the gifts and inclinations with which he was endowed. Perimetry and the examination of the central field of vision for colour defects, absolute and relative scotomata were playing larger parts in investigations, and attention in these matters must be paid to the personal equation. One investigator's charts would rarely be found to coincide with those of another on the same patient: only when a surgeon had stereotyped his own personal equation and controlled that of his patient would his results on the same patient on successive dates be reliable for clinical purposes. Tonometry was tending to replace the digital estimation of intra-ocular pressure, and it was for the younger ophthalmologists to explore its value; but it would not yet quench the older

method. The indications for or against operation in a case of chronic glaucoma would never be determined by such variables as the readings on a tonometer or the fluctuations of the blind spot. Too often the ophthalmologist was confronted with the highly myopic sempstress or clerk, incapacitated in later years of their working life by failing vision. A little guidance given to the progressive myope about to embark on the serious business of life might save such a one from a life of misery, ending in shipwreck. Compared with such help the most perfect retinoscopy was of little value. He advocated a closer coöperation with colleagues in general medicine and surgery. The gain from this would be mutual, but ophthalmologists must keep their own house in order: the student must be taught that in dealing with his patients he had responsibilities which he could transfer to no other. Laboratory investigations might supplement his work, but they could not be a substitute for it. The study of disease in the eye could be undertaken only by those who had first been trained in every branch of medicine and surgery; in this there could be no compromise. Ametropia and its results could not be surrendered to the optician. A vision of 6/6 was not proof that there was no disease in the eye.

The address concluded with a sympathetic reference to the recent passing of Charles Higgens and H. E. Juler, and an appreciation of their work. On the motion of Sir ANDERSON CRITCHETT, Mr. Fisher was cordially thanked for his address.

Cyclitis with Glandular Enlargement.

Mr. A. MAITLAND RAMSAY (Glasgow) read a paper entitled: A Case of Cyclitis associated with Swelling of the Parotid Glands. The patient was an unmarried lady, aged 31, who had always enjoyed good health. Strenuous war-work produced ill-health, and one morning her lower eyelids were puffy and her ankles swollen, and the swelling later extended to the knees. The skin was hyperæsthetic, and she had severe intercostal pain. Ten days in bed led to the swelling subsiding, but not the pain, and the latter was only temporarily relieved by large doses of aspirin. The eyes subsequently watered on exposure to light and the sight became dim, and pericorneal injection was obvious, with discoloration of the iris. There were irregularity of the pupil and a deep anterior chamber. There was no impairment of colour-sense, and no gross lesion in the optic disc or retinal vessels, choroid, or retina. Under the idea that it was a deficiency disease, thyroid extract was given, and within a week the sight began to improve. Neither mumps nor diphtheria entered into the problem. Gradually the patient was restored to good health.

Lamellar Cataract with Persistent Pupillary Membrane and Birth Injury.

Mr. J. GRAY CLEGG read a paper by himself and Dr. GORDON RENWICK, entitled Partial Monocular Lamellar Cataract associated with Persistent Pupillary Membrane and Birth Injury. The patient was a boy, whose history had been good. He had an injury at birth, when instruments were used, and on the left eyebrow were three small scars. The lids were much swollen for ten days after birth. The appearances were minutely described with the aid of the epidiascope.

Mr. R. RUSTON JAMES read an interesting contribution under the title: "Sir William Read, oculist to Queen Anne and to George I., Quack, Mountebank," in which he exposed the ambitious claims of Read in the domain of eye diseases.

Flat Neoplasm of the Choroid.

Mr. D. J. WOOD sent, from Cape Town, an account of two cases of Flat Neoplasm of the Choroid. One patient had a widely-dilated pupil, unusual redness of the outer part of the sclerotic, and a detachment of the retina close to the back of the lens. Disease was discovered in the left antrum and in the back part of the lower jaw. There were enlarged glands on the right side of the neck, and a portion excised was thought to be epitheliomatous. X-rays brought about some improvement, but it was evident there was an intra-ocular tumour, as the iris began to bulge on the outer side. Excision of the eye was carried out, and a flat sarcoma was found extending from the optic nerve forward to the iris, with complete detachment of the retina. It went up to the optic nerve, but did not involve it.

Symmetrical Encroachment of the Conjunctivæ on the Corneal Margins.

Mr. WOOD also sent a paper on this subject. The man had been treated by his doctor for cellulitis at the root of the nose; the lids were closed and the eye looked red. After simple treatment, pus was evacuated from the lids, and the condition healed in two weeks, but the eye remained red. The corneal margin was found to be covered by a ring of conjunctiva 2½ mm. wide, and the conjunctival blood-vessels were continued into it. The cornea was dull and covered by a series of reticulated grooves; it was also anæsthetic to a considerable extent. There was neither ptosis nor motor failure; tension was normal. With a fine probe the conjunctiva could be separated from the cornea.

Discussion on the Psychology of Vision in Health and Disease.

Thursday afternoon was devoted to a discussion on this subject. It was opened by

Professor C. SPEARMAN, Ph.D., who dealt with the Retinal Corresponding Points. We see objects in different places, he said, and the question as to the source of this power is one of the most difficult in all psychology. There were two camps of authorities: the "empiricists" and the "nativists." The first of these regarded visual place as the outcome of experience and arising through some such process as "association" or "fusion." The nativists were chiefly physiologists, such as Galen and Johannes Müller, who maintained that this power is essentially innate. According to them, the apparent situation of any visible particle was "specific energy" of the particular nerve fibre stimulated. They claimed that the pathological cases supported their view. The sharp demarcation between the two divisions of thought was now softened down, and it no longer seemed doubtful that our spatial perception was, at any rate partly, determined by factors of a hereditary character. If the origin was to be sought in experience, it must be in some degree that of our ancestors. Wheatstone showed that the pair of images thrown on the two retinæ by a visible particle did not, in general, fall on "corresponding" points of the retinæ; it was, in fact, their very deviation from "correspondence" which furnished our chief criterion of distance and depth. Wheatstone also brought evidence that such a pair of images, though thus falling on "non-corresponding" points, could, nevertheless, be seen as a single image. Straub concluded that the binocular perception of distance must be merely derivative from the far older uniocular perception of it. The present paper offered a new figure in support of Wheatstone's view: that two retinal points, although truly "corresponding" and normally producing the same visual situation, could nevertheless, under certain circumstances, engender different visual situations. In fact the spectacle might be presented of an object moving backwards and forwards, although the place of retinal stimulation remained unchanged.

Mr. J. HERBERT PARSONS, F.R.S., read a paper on

The Evolution of Visual Perceptions, with Special Reference to the Rôle of Suppression.

Vision was, he said, one of the latest evolved o the senses; it belonged to the group which Professor Sherrington termed "projicient." The earliest evolved sentient response to stimuli from the outer world was of the contact order; it had many of the characteristics which had been ascribed to what Head called protopathic sensation. Later differentiations were of the epicritic type, leading to more

accurate discriminations in various directions. Ophthalmologists were prone to regard the phenomena of binocular vision as themselves sufficient to account for judgments of distance, &c., yet these depended upon standards of posture and direction which were derived from the labyrinth and other parts of the proprioceptive system. Visual sensations could be divided into various kinds, of which the light sense was the most primitive. Peripheral vision was more rapidly fatigued than was central vision; but this rapid fatigue was more than compensated for by the acquisition of heightened mental capacity to appreciate change of local sign; in fact, it might be advantageous. Binocular vision might be regarded as primarily an adaptation in the interests of self-preservation, specially associated with the pursuit and capture of prey, and, to a less extent, in self-defence. Ophthalmology, he said, could not afford to ignore psychology; on the other hand, the only sure foundation for the science of psychology was biology and physiology.

Sir ROBERT ARMSTRONG-JONES related a case of acute melancholia who recovered on being supplied with proper glasses. He had often noted marked hyperæsthesia of the retina accompanying exhaustion. The poison of fevers caused visual rather than any other sensory hallucinations, and the poison of syphilis more often affected the sight than the hearing. In his experience there were far fewer blind than deaf insane persons, and the blind insane were not so suspicious as the deaf, and were more amenable to discipline. He referred to the relief afforded to mental states by appropriate colour-schemes.

Dr. S. A. KINNIER WILSON read a communication dealing with psychological peculiarities in certain visual auras in epilepsy, which had been termed by Hughlings Jackson a "voluminous mental state." There were two distinct types which were of interest to the ophthalmologist: (1) the "déjà vu" or "familiarity" type, in which the patient had a strong sense of having seen something new on a previous occasion, with its corollary the "strangeness" type; (2) the "visual memory" type. He related some interesting cases of each.

Dr. A. S. PERCIVAL also read a paper, in which he dealt with the mechanism of vision.

Amblyopia from Disuse.

Mr. FRANK JULER read a paper entitled: Amblyopia from Disuse; Visual Acuity after Traumatic Cataract in Children. He said he thought that in certain cases of injury to the lens in young children a line of evidence might be obtained which would satisfy the disputators and perhaps decide whether amblyopia from disuse existed or not. In most cases of traumatic cataract the opacity was rapid, and little light reached the retina after the date of the injury. In some of his cases the lens matter had been evacuated soon afterwards, leaving only an opaque membrane, and in a few an artificial pupil had been made not much later. Even in cases where an artificial pupil had been made, the diffusion of images by the aphakic hypermetropia must be so great that the retinal impulses could not compete with or assist those transmitted from the retinæ of the sound eye, and one would expect these impulses to be neglected, with the consequent development of amblyopia from disuse. He had traced a number of cases of juvenile traumatic cataracts, had himself formed a new pupil in some. There was a striking line of difference between the final visual results, depending on the age at which the lens became opaque. None of the eyes which became cataractous before the age of 5 had retained a final central acuity of vision of 6/60. The series showed there is such a disease as amblyopia of disuse, that it affects the eyes of children up to 6 years, that it does not attack eyes after the age of 7 years, and that it causes a real retrogression of the effective power of the retinal impulse on the consciousness after the macula has reached an age at which a central vision of 6/6 is normally present.

(To be concluded.)

ROYAL MEDICO-CHIRURGICAL SOCIETY OF GLASGOW.

EXHIBITION OF CASES AND SPECIMENS.

A MEETING of this Society was held in the Faculty Hall on April 15th, the PRESIDENT in the chair.

Dr. ADAM PATRICK described a case of

Renal Diabetes.

He said that in the normal person the blood sugar varies from 0·07 per cent. to about 0·15 per cent. or rather more. If the latter concentration is exceeded, sugar appears in the urine. In healthy persons it is difficult to raise the blood sugar above this level. In the diabetic the threshold concentration is habitually exceeded and readings of 0·25 per cent. or much higher may be got. A single reading of this sort is enough to establish a diagnosis of true diabetes. Sugar may also appear in the urine if the renal threshold is lowered, even if the blood sugar does not exceed the normal. In the normal subject the limit of sugar concentration is reached in about an hour, whereas, in the diabetic the maximum is not reached for two or three hours. Dr. Patrick described the case of a man, aged 38, who was found to have glycosuria on examination for life insurance; five years before sugar had not been present. The patient's health had been good save for an attack of hæmaturia (cause unknown) 10 years before, when there were no accompanying symptoms. Treatment on the lines suggested by Allen was instituted without great success and the urine only remained sugar-free in a diet approaching starvation. In hospital it was found that on a very restricted diet and with the blood sugar reading only 0·05 per cent., there was a trace of sugar in the urine, and that, on ordinary diet there was abundant sugar in the urine, although the blood sugar two and a quarter hours after dinner amounted only to 0·114 per cent. Tested by administration of 25 g. of glucose after a 16-hour starve, the blood sugar curve was normal in type. Dr. Patrick applied the name "renal diabetes" because the glycosuria appeared to be due to a defect in the kidney.

Prof. J. M. MUNRO KERR read notes of a case of

Resection of a Double Uterus

followed by two full-time pregnancies. He also showed the uterus, which had been removed after Cæsarean section. The diagnosis lay between an extra-uterine pregnancy, a myoma complicating a uterine pregnancy, and a pregnancy in the form of a double uterus. The expulsion of the ovum from the right horn of a uterus bicornis settled the matter. The patient had a second miscarriage at a later date from the same horn. Both miscarriages occurred at the third month. The resection of the uterus (bicornis unicollis symmetricus) was done seven months after the last miscarriage. A V-shaped wedge was removed and the two halves of the uterus carefully stitched together. Pregnancy followed soon afterwards and a full-time living child was delivered with the help of forceps, but died owing to injuries sustained at birth. The uterine scar was found to be quite satisfactory on manual examination. Some months later the patient again became pregnant and at full time Cæsarean section was done and the uterus removed. Prof. Munro Kerr demonstrated the uterine scar on the anterior and posterior walls of the uterus. These, especially the one on the anterior wall, were satisfactory, but there was a gutter-shaped indenture in the posterior wall over which the placenta was attached. Microscopically much connective tissue was seen in the scars, particularly in the posterior one. The operation has been done on one or two occasions in continental cliniques, but so far as Prof. Munro Kerr knew, not before in this country. The indication for the operation was repeated miscarriages, which seemed to be common in this form of malformation.

Dr. JAMES HENDRY described a case of

Amenorrhœa Following Severe Trauma.

In May, 1919, the patient reported three months amenorrhœa without other signs of pregnancy. Her appearance suggested thyroid insufficiency and there was no sign of pregnancy. The disturbances suggesting hypothyroidism were only of recent date. Health previously had been normal. Treatment with thyroid extract was prescribed and continued for a few weeks without improvement, and, in fact, the patient became stouter and stouter and more and more drowsy and apathetic. On again reviewing her history in detail it was discovered that a few weeks before the patient first missed a period she had fallen on the back of her head. Next day her sight was affected and vision was almost lost, but had almost completely returned. Dr. Hendry then thought of a possible lesion of the pituitary gland and administered, orally, tablets of pituitary (whole) gland without any success. By June, 1920, Fröhlich's syndrome had developed — dystrophia adiposo-genitalis, with lethargy and somnolence, and menstruation had returned in a scanty form, lasting one day. A skiagram of the skull to show the sella turcica was obtained and signs of a fracture were seen. The patient could inject 300 g. of glucose without glycosuria. The oral administration of extract of pituitary gland having proved unsuccessful pituitrin administered hypodermically was tried with no success. Five months ago hypodermic injections of antuitrin (Parke, Davis and Co.'s extract of anterior lobe) were commenced and weight is steadily diminishing, although food intake is normal. Regarding sugar tolerance, 120 g. of glucose now produces glycosuria. The special interest in this case is the association of amenorrhœa with hypopituitary function.

Reviews and Notices of Books.

RONTGEN DIAGNOSIS OF DISEASES OF THE ALIMENTARY CANAL.

Second edition. By RUSSELL D. CARMAN, M.D., Rontgenologist, Mayo Clinic; Professor of Rontgenology, University of Minnesota. London and Philadelphia: W. B. Saunders Company. 1920. Pp. 676. 42*s*.

THE first edition of this book appeared in 1917 and was accorded the favourable reception it well deserved, for the work is characterised by a thoroughness and accuracy well up to the high standard of the famous clinic with which Dr. Carman is associated. It has been thoroughly revised in the light of recently acquired knowledge, and new chapters have been added on the hour-glass stomach and the pneumoperitoneal method of examination of abdominal lesions. A valuable feature is the description of those small details of manipulation of the patient during the examination which will best bring out the points most useful in diagnosis. This specially applies to investigations of the stomach and duodenum. The chapter on the X ray diagnosis of gall-stones shows a considerable advance since the publication of the first edition. Throughout the work many new cases are illustrated and described in detail, and the volume is one that cannot fail to be interesting and instructive to medical men who are actively working in abdominal disease from whatever point of view.

A brief passage in the chapter on Interpretation is worth quoting: "The veteran rontgenologist, as well as the novice, is tempted to see too much rather than too little. Once the observer has acquired some familiarity with his work he will find that direct signs of lesions will be manifest quickly or not at all." This comment seems to us significant and well worth remembering.

RADIOLOGIE ET RADIUMTHERAPIE.

By BÉCLÈRE, COTTENOT, and Mme. LABORDE. Paris: A. Maloine et Fils. 1921. Pp. 520. Fr.30.

THIS is the thirty-second volume of a series being published in Paris under the direction of Drs. Sergent, Ribadeau-Dumas, and Babonneix, with the general title, "Traité de Pathologie Médicale et de Thérapeutique Appliquée." An introduction is contributed by Dr. M. Béclère, in which the history and present position of the use of the X rays and radium in medicine is reviewed. X ray diagnosis and X ray treatment are dealt with by Dr. Paul Cottenot, ancien interne des Hôpitaux de Paris, and forms a very complete yet concise treatise on the whole subject. His style is clear and his methods are practical. A number of the radiographs have suffered in reproduction, but this is compensated for by the free use of numerous diagrams, which frequently are more useful for teaching purposes. The section on X ray therapeutics is very complete, forming a sound treatise on a difficult subject, and one that will be of great value to students.

For the final section on radiumtherapie, by Mme Laborde, we have nothing but praise. The subject is handled with scientific knowledge and thoroughness, and with a clarity that excites our admiration. The volume will be of great interest to those radiologists who like to keep in touch with the work of their French colleagues.

INFANT EDUCATION.

Second edition. By ERIC PRITCHARD, M.A., M.D.Oxon., M.R.C.P. London: Henry Kimpton. 1920. Pp. 226. 6*s*.

THIS little book originally consisted of lectures which were given to the health visitors of the St. Marylebone Health Society in its earlier days. Since its first edition in 1906, 15 years have elapsed, and during this period its author has seen the wide dissemination of many of the principles therein enunciated and the development of a large school by which they are accepted. Moreover, the rapid and great strides of the infant welfare movement, in which the author has played a prominent part, and the formation of numerous infant welfare centres, have augmented the value of a book which sets out to instruct the lay worker in the elements of infant education based upon considerations of physiology.

From their very nature these lectures of necessity contain a vein of dogmatism. Again, it would be idle to expect that in such a subject the author would be able to steer clear of contentious matter. There emerges, therefore, a book in which there are many statements, clear and definite enough, and admirably expressed, but for which it would be difficult to provide proof and about which there are opinions more conflicting than a perusal would lead the lay reader to suspect.

In the present edition four new chapters have been added, one on the care of the new-born infant, one on the feeding of children at and after weaning, one on the practical details of infant feeding, and one on rickets. The author is an exponent of the calorie method of infant feeding, basing his recommendations as to the total quantities of food to be given at the various months on the supposed caloric requirements of the infant.

There are many who would join issue with regard to this advice. It might reasonably be asked whether we have sufficient knowledge to decide upon the average number of calories required by an infant of a particular age; whether the physiological variations are not too great for the reasoned application of a method so precise in its nature; and whether cow's milk is a food of standard caloric value. "If we wish," writes Dr. Pritchard, "to know, for instance, how much of any particular food should be given to a baby four months old, the

calculation can be made in the following manner: On reference to Table, p. 100, we see that the caloric requirements of a child of this age are 612 calories for the 24 hours; from this it is again easy to estimate how much condensed milk, dried milk, or other substitute food must be given in order to supply the required number of calories." Even the adherents of the system, we think, would qualify this statement, for the question of the weight of the baby is omitted and apparently plays no part in the calculation.

Other dicta which we think would provoke criticism from a medical audience is that the food of infants should adhere to the standard of breast milk throughout the first year of life, and that the weaned child requires rather less protein than before weaning. Also that an excessive nitrogenous diet as judged by this standard always leads to pathological results of which "intestinal toxæmia, liver attacks, migraine, neurotic conditions, sleeplessness, offensive breath, muddy complexion, eczema, and a thousand and one ailments commonly regarded as 'gouty'" are cited as typical.

The chapter on rickets includes an exposition of Dr. Pritchard's views on this disorder, long held by him but still awaiting general acceptance. It is an author's privilege to expound his own views in as decisive a manner as he desires, but these few illustrations of the more contentious statements in the lectures—and there are many more of the same category—will serve to show that the lay reader will have no little difficulty in distinguishing how much is accepted as truth and how much is hypothetical.

We hasten to say that the book serves a very useful purpose in stating in simple language and lucid style the principles which underlie infant training, hygiene, and dieting and that any reader who imbibes these principles, even to the written details of their application, will have an eminently safe outlook on the management of healthy infants.

THE GREAT RIDDLE.

The Action and Effects of Natural Forces and Conditions in The Creation. By FRANK HORRIDGE. London: Kegan Paul, Trench, Trübner and Co. 1921. Pp. 98. 3s. 6d.

WE gather from some reviews and a ballad which are quoted (as an advertisement) in this book that Mr. Horridge is favourably known as a writer of ballads, and the particular one quoted is certainly good. In the volume now before us he has made a new departure and has set about finding a solution to the origin of life, which apparently he considers as "all that we understand under the term creation." His theory is simple enough, but it does not explain the mystery. "We have only to conceive a certain mixture of the elements as having taken place and carbon derived from carbonic acid acting so to speak as the keystone of the physiological arch which constitutes the nucleus and over which the superstructure of organic life in all its various forms is raised and the problem in its initial stage is solved" (p. 25). Mr. Horridge's other thesis is that "every part and organ of the human body or that of any living creature depends for its position, its form, its function and very existence on that which one may term its dynamic environment." Mr. Horridge attributes the transparency of the stratified epithelium of the cornea to the vibratory effects of the rays of light (p. 55), but he does not explain why rays of light beating on other parts of the body do not produce transparency there. On p. 11 he seems to us to use the words "mobile" and "mobility" in the two senses of "easily moved" and, "capable of independent movement." Thus he says "Protoplasm though like air and water in being mobile differs from both in being more complicated," and his conception of the ether seems to us to be extremely hazy. The book is interesting, but we cannot think it of any value as a contribution to knowledge.

DE L'ANAPHYLAXIE À L'IMMUNITÉ.

By M. ARTHUS. Paris: Masson et Cie. 1921. Pp. 361. Fr.20.

IN 1903 Arthus announced that horse serum, harmless to a normal rabbit, causes in a rabbit previously treated with injections of the serum a series of local, general, immediate and remote ill-effects. This fundamental discovery, known since as Arthus's phenomenon, is one of the stones on which the immense superstructure of anaphylaxis has since been reared. The present volume is in no sense an attempt to survey the whole subject with its related topics of protein poisons in general and resistance; it is a synthetic account of the experiments which the author has made himself, most of which have been already described in various periodical publications. The narrative is detailed and the result is more suitable for the technical expert than for the general reader. There are no guinea-pigs with their dramatic deaths from bronchial spasm, but there is an immense amount of information about the effects of different proteins on the blood pressure and respiration of rabbits, data which do not perhaps generally receive the attention they deserve. In an interesting preface the author gives some account of his views on the methods of scientific investigation; he classes theorisers with politicians, though the rest of the book is not nearly as dull as this would lead one to expect. Noteworthy, too, is his belief in the supreme value of solitary meditation—testimony from an old and experienced worker which is of value in these days of ceaseless and restless experimentation.

VETERINARY HYGIENE.

By R. G. LINTON, M.R.C.V.S., Professor of Hygiene, Royal (Dick) Veterinary College, Edinburgh. Edinburgh: W. Green and Son, Ltd. Pp. 429. 26s.

HITHERTO veterinary literature has been more concerned with the cure and treatment of disease than its repression and prevention. But there has always been room and need for stressing the lessons of hygiene and for their presentation in comprehensive form. The work under consideration has been written for veterinary practitioners and students and others concerned with the well-being of animals, whilst the requirements of those studying for the Diploma of Veterinary State Medicine have not been forgotten. It may be said at once that Prof. Linton has done his work well, and has, moreover, had the assistance of collaborators who are all experts in their professions.

The book is divided into seven sections, dealing respectively with Water, Meteorology, Sanitation, Air and Ventilation, Building Construction, Preventive Medicine, and Sanitary Law.

The chapter on sanitary law will be of high practical use to the veterinary inspector, as it deals quite comprehensively with all the various Acts and Orders with which he ought to be familiar. The general practitioner will be chiefly fascinated with the chapters on building construction and preventive medicine. Too many men with very imperfect knowledge as to the hygienic requirements of horses, cows, and pigs still have the prime voice in the construction or improvement of their housing. The construction of cowsheds is well discussed in this volume. The reasons given for the adoption of a wide milking passage may be supplemented by the fact that if there is plenty of room dung is less likely to contaminate the milk pail when the attendant passes up and down behind the cows. We may add that the passage should be 3 or 4 inches below that of the cows' beds, as this enables the milker to get more readily at his cows and, moreover, where there is a shallow side to the gutter, the work of shovelling up the manure is rendered easier. We are glad to note that the author lays stress on the need for cleansing and disinfection of premises in cases of swine fever.

Professor Linton shows his knowledge of the conditions met with in practice by the sage remark

that "an outbreak of disease is often the only opportunity there is to get a place clean: it is well then to make the most of it." We have not much faith in insect powders either for the prevention or eradication of fleas in dogs or cats, and there are far simpler remedies for lice in horses and cattle than those mentioned by the author, and they are quite as effective.

Professor Linton's book will convince the reader of the importance of adequate representation of veterinary surgeons at the counsels of the Ministry of Health.

HANDBOOK OF OPERATIVE SURGERY.

Second edition, revised and enlarged. By K. K. CHATTERJI, F.R.C.S.I. London: W. Thacker and Co.; Calcutta and Simla: Thacker, Spink and Co. 1921. Pp. 311. Rs.10.

THE author of this handbook does not claim more for it than its title implies. It is necessarily restricted in extent, and many of the operations are described in few words. It is, in fact, rather a summary of operative surgery for the student than a text-book for the practitioner, but to the former it should prove extremely useful. The surgical anatomy of the parts and the indications for operation are clearly and concisely given. The diagrams are good as far as they go. The operations described embody several "author's modifications," but it may be doubted whether these are all original; the methods conform on the whole to the older orthodoxy, and a number of recent modifications of operations other than the author's might have been introduced with advantage. An unusual feature, which should be particularly useful to those for whom the book is primarily intended, is a description of the operations for elephantiasis and tropical liver abscess.

MANUFACTURE OF SUGAR FROM THE CANE AND BEET.

Monographs of Industrial Chemistry. By J. H. P. HERIOT. London: Longmans, Green and Co. 1920. Pp. 426. 24*s*.

IN this interesting and readable volume Mr. Heriot has endeavoured to show that successful practice in the manufacture of sugar is now more than ever dependent on scientific principles, and that these can be studied more effectively outside than inside the factory. Attention is directed to the rather narrow outlook of the British Cane Sugar producer, and it is urged that the student of sugar technology should keep in touch with all branches of sugar production even though he may only specialise in one. This volume will enable him to study the cane and beet sugar industries side by side and to note the progress made in each.

The subject-matter is treated generally and concisely under the following heads. The extraction, composition, and treatment of juice from the cane and beet; the evaporation of water from the juice; crystallisation; extraction of sugar from molasses; by-products; and the refining of cane and beet sugars. A number of good illustrations will be found of material assistance to the reader.

Mr. Heriot has produced a useful volume and it should help in the propaganda which, it is hoped, will result in the development of a beet-sugar industry in this country.

MILK TESTING.

By C. W. WALKER-TISDALE. London: J. North. 1920. Pp. 90. 3*s*. 6*d*.

ALTHOUGH a considerable amount of data have been collected by officers of county councils and other officials bearing on the quality and quantity of milk yielded by cows in herds, it is obviously more satisfactory if the farmer can carry out systematic tests for himself. It is for those connected with the dairy industry who would not describe themselves as analysts, but to whom accurate tests are nevertheless of great importance, that this little volume is intended. The author gives a clear and concise account of the methods usually employed in the analysis of milk. A number of well-selected illustrations will doubtless be an aid to the comprehension of the working details by the non-expert. We think, however, that whilst it is quite possible for the farmer or buyer to learn or to be shown how to work mechanical processes such as the "Gerber" test, he would be wise to leave the chemical technique involved in the examination for preservatives, and in the catalase and reductase tests, to those who are experienced in such matters.

THE ART OF ATTAINING HIGH HEALTH.

Together with Aristology or The Art of Dining. By THOMAS WALKER. Also A Sure Method of Attaining a Long Life. By LEWIS CORNARO. The Pilgrim's Books, No. 5. London: Philip Allan and Co. 1921. Pp. 271. 5*s*.

THESE three essays are rightly included in a series for pilgrims. They set forth ways and means for making the best of our earthly pilgrimage through temperance and the reasoned enjoyments of the pleasures of the table. Health both of body and mind, which connotes a well-spent life and the performance of our duties both to ourselves and to our neighbour, is thus to be attained. The Walker of the nineteenth century and the Cornaro of the sixteenth had both assimilated the old Greek adage of "Nothing too much," and both brought upon themselves the ridicule of acquaintances, but they persevered, and like Bunyan's pilgrim found themselves able to say—

> "Who so beset him round
> With dismal stories
> Do but themselves confound,
> His strength the more is;
> No foes shall stay his might,
> Though he with giants fight
> He will make good his right
> To be a pilgrim."

Mr. Walker tells us that during childhood and adolescence, he was scarcely ever free from illness, but one day while reading Cicero's De Oratore some passage suggested to him the expediency of making a study of the improvement of his health. "I rose from my book, stood bolt upright, and determined to be well." And he succeeded to a remarkable degree. He dieted himself and made a practice of taking the air before eating anything—i.e., of going out before breakfast, although he does not seem to have adopted the simple plan of sleeping with his window open. But he attained to such a condition that even when he walked on a dusty road no dust adhered to his feet or shoes or stockings. "By way of experiment I did not wash my face for a week, nor did anyone see, nor I feel any difference. One day I took hold of the branch of a tree to raise my self from the ground, when I was astonished to feel such a buoyancy as to have scarcely any sense of weight." The famous Lord Herbert of Cherbury also attained to a purity of body such that, as he tells us in his autobiography, "the shirts, waistcoats, and other garments I wear next my body, are sweet beyond what either easily can be believed or hath been observed in any one else." Moreover, "I have weighed myself in balances often with men lower than myself by the head, and in their bodies slenderer and yet was found lighter than they." It is but a step from the stage attained by Lord Herbert and Walker to the powers of levitation enjoyed by many holy men both of the West and the East, powers which they could impart to inanimate objects, e.g., in the case of St. Piran, who sailed from Ireland to Cornwall on a millstone.

Mr. Walker having attained high health proceeded to enjoy it with the restraint which is fitting, and hence the discourse upon Dining, which is full of sound sense, although here and there we disagree with him—for instance, where he says that "port

only taken with or without a little water at dinner is excellent." But his remarks upon claret and champagne, together with his insistence on simplicity in everything at table, whether linen, plate, china, glass, or food, with the proviso that everything should be the best of its kind, are outside criticism. One of the good points which he makes is that the fire should be "one of the party," by which he means that no one should have to sit with his back to the fire and the fire screened off, but that the place opposite the fire should be left vacant. Altogether Mr. Walker's papers are well worth reading and remembering, even if the reader may sigh for the days when, in speaking of claret at a famous club, he says, "I would not wish better than that given at the —— at three and sixpence a bottle."

Cornaro's paper has been a classic for centuries, and most of the books upon diet and long life are founded thereon, but we are grateful for a handy reprint.

A HANDBOOK FOR NURSES.

Sixth edition. By J. K. WATSON, M.D. London: The Scientific Press, Ltd. 1921. Pp. 770. 10*s*. 6*d*.

Dr. Watson's Handbook for Nurses is well known to the nursing profession, and the revised edition will be welcomed by probationers and qualified nurses alike. It includes valuable chapters on the Symptoms of Disease, Electricity and Massage, Ear, Nose, and Throat Affections, Skin and Venereal Diseases, whilst every chapter of the former edition has been carefully revised and brought up to date. The number of illustrations has been considerably increased, and an appendix of questions based on the contents of each chapter should prove useful to student nurses.

If the worth of a general text-book may be assessed by its popularity, this book is a valuable contribution to the education of nurses.

NURSING IN EYE, EAR, NOSE AND THROAT DISEASES.

By A. EDWARD DAVIS, A.M., M.D., and BEAMAN DOUGLASS, M.D. Philadelphia: F. A. Davis Co. 1921. Pp. 346. $2.50.

As a guide, for nurses and students, in the care of the diseases of the eye, ear, nose, and throat, this book is a valuable supplement to a general nursing text-book, and the instruction should be of great help to many who have failed to obtain practical experience in these special branches during their general training. A brief outline of the anatomy and physiology of the special organs treated and a sound chapter on Drugs and Prescribed Treatment should increase the professional interest of the nurse in her duties.

Dr. Davis strongly advocates a general training for all nurses who intend to specialise in ophthalmic nursing.

"WADE IN SANITARY."

The Story of a Division Surgeon in France. By Lieut.-Colonel RICHARD DERBY, M.C., U.S.A. London and New York: G. P. Putnam's Sons. Pp. 260. 12*s*.

THIS is an interesting book, but one which has two great blemishes. First, there is no index, and secondly there is no map, and as the incidents in the book occur in a great variety of places the want of a map is much felt. However, Colonel Derby gives a most graphic account of the work of the American Medical Department, and very good work it seems to have been, especially that for which he was responsible, concerning which he is most modest. It was due to him that the plan was adopted of having a hospital as close up to the firing line as possible. This made it possible for the wounded to be dressed and cared for within some twelve hours or less of the reception of the wound, a practice which resulted in a great saving not only of suffering, but of life. The victims of mustard gas were especially benefited by rapid treatment, and the nearness of the hospital made the surgical practice of complete excision of the wound tract as a preventive of infection practicable, with the result of an enormous diminution in mortality. This plan naturally entailed very rapid evacuation of the wounded and a consequent responsibility upon stretcher-bearers and ambulance drivers, to whom Colonel Derby awards unstinted praise.

Apart from the purely medical and military details in the book, there are a number of remarks upon the social and political aspects of the war and post-war period which are well worth reading, especially in the chapter entitled "Wise in Time," taken from Roosevelt's pregnant motto, "Nine tenths of wisdom consists in being wise in time."

JOURNALS.

Journal of the Royal Naval Medical Service.—From the April issue we learn how important to the fighting service are men with normal binocular vision and binaural hearing. Surgeon Commander W. K. D. Breton tells of the ingenious machine there has been made for him in H.M.S. *Excellent* to measure the degree of stereoscopic vision possessed by men who are to be trained as stereoscopic range-takers. Three needles are arranged in a plane, six metres from the observer and at right angles to the line of sight. The central needle only moves forward or backward, and the small distances through which it can be moved without appearing to the observer to be out of that plane are measured. This may easily be 8 cm. (1·3 per cent.) either way. The smallest error noted in the paper was 5 mm., less than 1 per 1000 of the range, and this range-taker, luckily, also made the most consistent observations. Commander Breton also gives a very clear account of the evolution of stereoscopic vision in animals and in man.—Surgeon Commander E. D. Rutherford tells of the tests that were required in the selection of men to be trained as anti-submarine detectors. They were preferred of ages 18 to 25 (as they trained more quickly), and should have rapid judgment, good hearing, and capacity for localising the direction of sounds and discriminating their intensities. He mentions that of men with enlarged tonsils 90 per cent. failed to reach the required standard of hearing, but only 75 per cent. failed of those who had had their tonsils removed. This paper should be read by all who desire to realise how many and novel were the problems that pressed for immediate solution during the war.—Surgeon Commander A. R. Fisher has a paper on otitis media as it occurred among the cadets at Osborne in the ten years 1910–19. He thinks it a sequela of a "common cold," and to be avoided by the Hancock nose drill. The fauces of the patient are cleaned by a saline douche (glucose, borax, and bicarbonate of soda) at 100° F., from a Higginson's syringe. Such a faucial douche is far more effective than gargles or sprays. In the 10 years quoted there were 303 such cases, and 41 additional in which it was only a complication.—Surgeon-Lieutenant Commander H. E. R. Stephens contributes to the "Naval Medical History of the War" a paper on Immediate Surgery in Fighting Ships. There are no bullet wounds, but the casualties are often large concussions due to the men being hurled by explosions against the sides of the ships. Then there are large ragged contusions by fragments of shell, but these fragments are so often raised to a high temperature in their passing through the sides of the ship that they sear the tissues like a cautery and diminish hæmorrhage. In a pause of the action the wounded can be collected. Then the skin about the wounds can be washed with ether soap, and torn muscle handled, but very gently for fear of the secondary wound shock; this last is best relieved by Bayliss's gum acacia solution. Large vessels must be tied or Cheatle's metal tourniquet applied to the main artery. After checking hæmorrhage, it is best to put a drainage-tube to the bottom of the ragged wound, pack sterile gauze around it, and syringe in eusol every two hours. All burns require to be cleaned up thoroughly under a general anæsthetic; on the completeness of the initial cleansing depends the outcome of the case. Oily applications retard cleaning, and are not recommended for first-aid dressings. But when the burn has been cleaned the best application is carron oil, ʒi., with menthol, gr. 3, and eucalyptus oil, ℥3. Chloroform is the best anæsthetic; for one thing ether is inflammable. This a ticle deals only with immediate surgery; the wounded should then pass to a hospital ship, whose share of the work the next article will consider.

THE LANCET.

LONDON: SATURDAY, MAY 28, 1921.

General Medical Council: The President's Address.

THE summer session of the General Medical Council was opened on Tuesday last, when the President, Sir DONALD MACALISTER, in a short address, reviewed the present position of medical affairs in relation to the special functions and activities of the Council. His address, which will be found in another column, points to the session being both short and business-like, and it is especially good hearing that the disciplinary cases to be inquired into are few and simple. Nothing incites more distrust of the medical profession as a whole, or more ill-informed criticism of the work of the Council, than the consideration of difficult and painful disciplinary cases. And when they are difficult, there must be no thought of economy of time in the desire to elicit the truth, for the marring of a whole professional life may depend on the issue. The debates in such cases produce the wrong impressions. Medical men forget that the disciplinary functions of the Council have been designed to protect the public, and are apt to feel that some of their colleagues are being punished out of all proportion to their offences; the public, assuming the general from the particular, form an unfairly low opinion of professional standards. Therefore it is always good to know that there are few penal cases to be considered by the Council.

The most important part of the President's address deals with medical reciprocity between this country, certain of our own dominions, and certain foreign countries. It is clear that much difficulty attends all laudable efforts towards free trade in medicine throughout the world. During the war this country granted to Belgian practitioners the privilege of practising within British territories, and Belgian medical graduates were made registrable in our British Foreign list. But the Belgian Government having now decided to require British practitioners to obtain a Belgian qualification as a condition of practice in Belgium, that piece of medical reciprocity has come to an end. In actual numbers of practitioners the rapprochement was not strong; but it was real, and we can only regret its quick cessation. On the other hand, there seems to be an opening for a professional understanding with Spain, a country which the course of modern history has probably been benefiting. The Executive Committee of the Council is making inquiries as to the position which practitioners, who are registered in the United Kingdom, would enjoy in Spain, and it will be interesting to learn what course of study or what examinations are likely to be required by the Spanish Government from our qualified medical men. Among our own dominions the question of reciprocity is to the fore in India and in South Africa, and, as on the continent, the position is alternately good and bad. For many years the diplomas of certain Indian universities have been recognised by the General Medical Council as affording registrable qualifications in this country, but it has been brought lately to the notice of the Council that at some of these universities the standards both of training and of examination in regard to midwifery have fallen below those which it is necessary to demand for registration. The Council has notified the universities that unless their curriculum in connexion with midwifery is raised to a satisfactory level, recognition in this country will be discontinued. With regard to the Union of South Africa, the story is exactly the reverse. The Union admits to its register medical practitioners who are registered in the United Kingdom, and is desirous that the degrees of its own universities should be accepted as registrable qualifications at home. Owing to the development of medical education in the Union, the Executive Committee of the Council has advised that Part 2 of the Medical Act can now properly be applied to South Africa, when the Council will be free to recognise such South African medical degrees as fulfil the prescribed conditions. The chance of real and widespread medical reciprocity between all civilised nations is as a whole growing stronger, because of the many directions where its institution is now ardently desired. The leaders of medicine will keep their eye on universal reciprocity as an ideal for the future, and we trust the practical sense of doctors to be ranged against any attempt to bolster up inadequate training, so as to secure a too previous entrance into national comity.

The third point to which we would draw attention in Sir DONALD MACALISTER'S address is the prominence which he gives, and gives rightly, to dental affairs. The dental profession, though increasing in popularity with students, is still undermanned, and this fact forms one of the great arguments in the public eye why the Dentists Bill, introduced three weeks ago, should promptly become law. The Dental Committee of the Council has had under its consideration all the drafts of that Bill during its preparation in the Ministry of Health, and as a result Sir DONALD MACALISTER considers the projected legislation to constitute a great step towards the removal of dangerous abuses. The abuses are those which have attended the practice of charlatans who have filled the gaps left by the paucity of trained men. The view is one that we have taken in our columns, but the inclusion of a number of additional dentists in a professional roll will not meet the situation in a satisfactory way unless the names of those added are subjected to rigid scrutiny.

Irradiation and Safety.

LIFE cannot be made safe, even for heroes. Youth is too adventurous and, by the time prudence has set in, the seeds of disease have often been sown or habits of body acquired which sooner or later impair health. It is an interesting speculation whether life can ever become safe, for with each new phase of culture fresh risks arise and the means devised for their avoidance, however prompt and ingenious, are necessarily a little behind the risks and never quite catch them up. So it has been with the application of X rays and other rays of short wave-length in medicine and industry. Like any other powerful therapeutic agent, irradiation may damage the healthy cells of the body while directed at diseased cells or parasitic invaders. It is for us to increase the working margin between toxic and therapeutic dose, to ensure the beneficent curative effect and eliminate the harmful by-effects. Much

has already been done, and it is a mercy that the searchlight of popular interest has only been turned on the scene in the third or fourth act. The first act of unprotected X ray exposure was on a small scale something very like tragedy. Dr. IRONSIDE BRUCE's lamented death two months ago awoke such startled interest just because in the meantime the use of irradiation had become a commonplace and scores of workers in many lands were using it unscathed on thousands of patients. The public in any case has little to fear since the risk is manifold for the operator.

The time has now come for the standardisation of protective measures and their enforcement wherever X rays and radium are employed, whether in the arts or in medicine. An important committee has been formed composed of radiologists, physicists, pathologists, and others, nominated by the Electro-therapeutic Section of the Royal Society of Medicine, the British Association for the Advancement of Radiology and Physiotherapy, the Rontgen Society, the National Physical Laboratory, and the Institute of Physics, which has come into existence just in time to take its share in a field of work peculiarly its own. The membership of the Committee is as follows:—

Sir Archibald Reid, radiologist to St Thomas's Hospital, and Dr. Robert Knox, radiologist to King's College Hospital, representing the British Association for the Advancement of Radiology and Physiotherapy; Dr. S. Gilbert Scott, radiologist to the London Hospital, and Dr. Stanley Melville (hon. sec.), radiologist to St George's Hospital, representing the Electro-therapeutic Section of the Royal Society of Medicine; Dr. Harrison-Orton, radiologist to St. Mary's Hospital, and Mr. Cuthbert Andrewes, representing the Rontgen Society; Prof. S. Russ, physicist to the Middlesex Hospital, representing the Institute of Physics; Dr. G. W. C. Kaye, representing the National Physical Laboratory; and Dr. J. C. Mottram, pathologist to the Radium Institute.

A preliminary meeting of this X Ray and Radium Protection Committee was held last week at the Royal Society of Medicine, under the chairmanship of Sir HUMPHRY ROLLESTON, when it was decided to issue as soon as practicable a considered statement as to the urgency of affording adequate protection to the worker, indicating the best means whereby this may be carried out. A subcommittee has been set apart for this purpose. The Committee itself proposes the much larger task of collecting data bearing on the effect of irradiation, with particular reference to protection, of carrying out any necessary research, and of acting in a consultative capacity, issuing reports at any useful stage of its investigations.

The Committee is more particularly interested in the question of irradiation as it affects the worker, the patient not being exposed to anything approaching the same risk. It realises that there must always be individual cases in which idiosyncrasy is a danger, and occasional failure of the personal element is hardly to be avoided in a workaday world. The first instalment of information may be expected to bear on such matters as the position of X ray rooms, their cubic content and standard of ventilation, the condition of the blood of workers, and the need for regularisation of work and ample supply of fresh air. In the meantime, any institute which feels anxious as regards the standard of its own protective equipment should apply for guidance to the hon. secretary of the Committee at 9, Chandos-street, London, W.1.

Anaphylaxis and Immunity.

IT was a happy coincidence in the series of independent post-graduate lectures being held at the Institute of Pathology and Research, St. Mary's Hospital, London, that a discourse emphasising the peculiar value of the study of symptoms[1] should be followed by one illustrating the confusion to which consideration of symptoms alone may give rise. If the same protein is introduced respectively into a guinea-pig, a rabbit, and a dog, all having been sensitised by a previous injection, the actual symptoms produced are in each case severe, but differ so widely for each species that, were they not known to have been provoked experimentally by the same agent, no one would suspect their common origin. The guinea-pig dies of asphyxia—traceable to constriction of the bronchioles—after a series of deep gasps for life, which leave the lung permanently distended with air. The rabbit dies of right-heart failure, due apparently to the contraction of the muscular coat of the pulmonary arteries; while in the dog the blood pressure falls to 30 mm., the liver is greatly engorged, and the animal presents a typical picture of intense circulatory shock. Nor are these phenomena even peculiar to anaphylaxis; other substances, various cleavage-products of proteins, and even a simple base, histamine, produce similar symptom-complexes—differing in each species but constant for the same species. Dr. DALE showed that these superficially different complexes could be connected as dependent on the contraction of plain muscle fibre and the poisoning of capillary endothelium, the incidence of these effects being differently localised in the different species. He proceeded to discuss the present position of the theories of the cause and significance of anaphylaxis as derived from experimental research. While the injection of certain toxic substances gives rise to similar symptoms, the characteristic feature of anaphylaxis is its occurrence in connexion with substances not normally poisonous. Dr. DALE gave a succinct and lucid account of the theories of the production of an anaphylatoxin and of the experimental evidence for and against Friedberger's hypothesis of its production as the result of the formation of an antigen-antibody complex in the body fluids, and then explained in rather more detail his reasons for believing that the reaction between antibody and antigen takes place within the body cells in anaphylaxis, and that this location of the reaction is the cause of the symptoms.

The technique which he had devised for studying this reaction consisted in the use of isolated uterine muscle, perfused free from blood, as an indicator. Plain muscle from an anaphylactic animal gives in vitro as specific and delicate a reaction as the animal itself. If to such a preparation suspended in Ringer's solution there is added the antigen to which the animal has been sensitised, the plain muscle contracts promptly and maximally; no other antigen has this effect, nor does the addition of antigen to the muscle derived from a non-sensitised animal give rise to any contraction. The specificity of the phenomenon is thus reproduced in vitro, whereas its delicacy can be estimated by the fact that a solution of 1 in 500,000,000 gives a recognisable reaction. Dr. DALE, after describing the experiments which convinced him that the phenomenon of anaphylaxis was due to a reaction of the precipitin type produced in the living cell itself, whereas excess of the antibody in the blood and body fluids, so that

[1] THE LANCET, May 21st, p. 1090.

the reaction occurs outside the cells, protects the sensitive structures, showed that this conception elucidates the whole subject of anaphylaxis. Far from being the opposite of immunity, anaphylaxis should be regarded as a protective phenomenon. Anaphylaxis should be regarded as a stage of immunity in which the resisting mechanism is located in the cells. When invasion of the tissues by a foreign protein takes place by natural means, as by an infecting organism penetrating the skin or mucous membrane, the local reaction to cell-injury produces protection against further invasion. When, by the artificial method of the injection needle, the antigen is brought rapidly into contact with all the cells of the body the anaphylactic reaction is the result. Anaphylaxis is thus not only compatible with but may even be a factor in resistance to infection. Dr. DALE pointed out that the only important chemical difference between species lies in the composition of their proteins. Organisms resent the artificial introduction of a protein of molecular pattern alien to their own; this is fundamental, because incorporation of an alien protein cannot be conceived without vitiation of type. To resist this vitiation the cell will die for the individual, or, if all the cells are affected simultaneously, the individual itself has to die in order that the purity of the species may be maintained.

MEDICAL INSURANCE AGENCY.

AT a meeting of the Committee of Management, held at 429, Strand, on May 12th, the chairman, Dr. G. E. Haslip, presented a report on the working of the Medical Insurance Agency for the year 1920. Substantial progress had, he said, been made in all classes of insurances. A gratifying feature was the large increase in life business. The special booklet prepared last May and circulated to non-members of the British Medical Association had brought in good business, many life, motor-car, and other policies being negotiated, on which the commissions earned by the Agency from this source alone amounted to over £250, practically the whole of the cost of printing and circulating the booklet being borne by the companies. The scope of the Agency is being extended and policies have been negotiated for medical men resident in British Guiana, India, and Mesopotamia. During the year 107 policies in all were taken out, the sums assured under them representing £99,138. A total of £1453 was returned to those insured through the Agency by way of rebates, or £493 more than in 1919. After allowing for rebates and agency expenses the surplus carried to the Medical Benevolent Account amounted to £1959. On this favourable financial situation the committee resolved to make grants of £315 each to the Royal Medical Benevolent Fund, the Royal Medical Benevolent Fund Guild, and the Epsom College Benevolent Fund. Mr. W. E. Warne, the retiring agent and secretary of the Agency, was thanked for his services, and Mr. P. N. Adamthwaite was appointed in his stead.

ROYAL NATIONAL HOSPITAL FOR CONSUMPTION, VENTNOR.—The report of this institution for the year ending December, 1920, was presented to the annual meeting of governors on March 17th, and has just been printed. The number of patients under treatment during the year was 790, as compared with 879 in the previous year, and the medical statement shows that 81 per cent. of the cases treated gained an average of 7 lb. in weight. The number of cases improved averaged from 80 to 90 per cent. according to the severity of the disease, and of 301 cases selected for treatment by graduated labour 234 were discharged fit for work. Subscriptions to the institution amounted to £1148 17*s.* 6*d.*, or £375 in excess of any sum received in previous years. The annual expenditure per occupied bed was £177 12*s.* 3*d.*, as compared with £147 2*s.* 8*d.* in 1919.

Annotations.

"Ne quid nimis."

TWO DEVELOPMENTAL ANOMALIES.

AMONG the interesting exhibits at a recent meeting of the Anatomical Society, held at St. Thomas's Hospital, were two which, while their embryological interest was probably unique, may be considered also to possess some import from clinical and pathological standpoints.

A Remarkable Vitelline Duct.—The first was a specimen of persistent vitelline duct continuous with the side of the appendix. It was removed by operation by Dr. P. T. Crymble, of Belfast, from an otherwise seemingly normal and healthy child. The vitello-intestinal duct has been seen and recorded as attached to various abnormal sites, but we believe this to be the first time it has been reported found arising in this way from the appendix. The duct normally loses its connexion with the gut about the fourth to fifth week of embryonic life and quickly disappears, but cases of Meckel's diverticulum, representing its persisting proximal end, are not of very rare occurrence. The cæcum and appendix are developed in the extra-abdominal loop of gut behind the site of attachment of the duct, so that the condition in the case under consideration could not be referred to want of growth of the intervening portion of the loop; it would almost seem as if the first conical cæcal outgrowth had arisen on the proximal side of the duct. There does not appear to be any insuperable reason why the area of continuity between duct and gut should not remain anywhere in that part of the intestine formed outside the abdomen, and in this case the microscopic examination negatived the explanation that the end of a separated duct might have contracted secondary attachments to the appendix lying near it in the umbilical sac. The fact that the conditions in this case, as in many of the other cases of a somewhat similar nature recorded, came under observation because the clinical state called for surgical activities, is an indication that the surgeon has some interest in the embryological conditions which underlie the occurrence of such rare abnormalities.

True Developmental Aphakia.—The other condition exhibited at this meeting was that of aphakia in an embryonic eye, reported by Miss I. C. Mann. Many authorities have doubted the occurrence of true absence of the lens apart from other gross abnormalities, and the very few clinical reports of cases claimed as coming under the definition are mainly unsatisfactory, or worse. There is no doubt, however, about the case we are now considering. The embryo, somewhat shrunk, had been placed developmentally in the "13 mm. stage" by Professor Frazer, to whose collection it belongs. The histological condition is not good, the result apparently of faulty preservation, but no other abnormalities were detected in it. There is total absence of the lens on each side, and nothing to suggest that there ever had been any lens formation. A minute depression of the deep layer of the surface ectoderm represents, possibly, the abortive effort to form a fovea. The eyeball is the same size as that of a normal 13 mm. embryo, but it has a persistent choroidal fissure, not involving the optic stalk; there is thus no indication of microphthalmos, but a possibility of coloboma if maturity had been reached. Normally there is ectodermal thickening at about 4 months, a definite fovea or pit about 5, and a closed vesicle at 7, while at 13 months the elongated cells of the definite lens are well shown, and the whole structure is in the optic cup, separated by a considerable interval from the surface layer. It has been known for several years, on experimental grounds, that the invagination of the optic cup is not

due to the formation of the lens, and this case is an interesting demonstration of the fact by Nature herself. Miss Mann's report puts the occurrence of true congenital aphakia, want of development, among the list of undoubted possibilities in ætiological pathology of absence of lens in living patients, for there would seem to have been nothing in the embryo itself to interfere with its survival.

HOOKWORM INFECTION IN BRAZIL.

WE have on former occasions called attention in these columns to the admirable work which has been done, and is still being done, by the International Health Board of the Rockefeller Foundation, more especially in connexion with their world-wide campaign against hookworm disease. In THE LANCET of Jan. 29th of the present year we commented on a report of this International Health Board, which dealt with the prevalence of ankylostomiasis in Egypt, the Malaya Peninsula, and the Dutch East Indies. Another report has now been issued (No. 14 of the series of Monographs of the Rockefeller Institute for Medical Research) giving the results of the investigations of two American experts, Drs. S. T. Darling and W. G. Smillie, sent to inquire into the prevalence of hookworm infection in Brazil. Their work was carried out in 1919 and was primarily directed to ascertaining the degree of infection of the native Brazilians by this helminth, its incidence on various occupations, the influence of race, and the effects of immigration on the introduction from without of fresh infection into Brazil. Efforts were also made to discover a routine method of treatment for hookworms that could be safely applied on a large scale to groups of persons, on plantations, for example, without the necessity of immediate medical supervision. The prevailing kind of hookworm in Brazil is *Necator americanus*, but *Ankylostoma duodenale* was found in every district that was visited by Drs. Darling and Smillie. It is interesting to note that the infection by this latter worm, though slight, is increasing, especially in places which have a changing population and where there is much immigration. The degree of hookworm infection in Brazil varies directly with the proximity of the individual to excrementally polluted soil. It is a disease of the rural districts, and more than 99 per cent. of the rural population of Brazil above the age of 6 years are infected with hookworms. The average number of worms per case in highly-infected districts was 136, though in some instances it was as high as 200 per case. Various remedies were tried with the view of finding a safe method of treatment that could be applied by unskilled subordinate officers on the plantations. The two principal drugs that were tested were beta-naphthol and oil of chenopodium. As a result of experiments the opinion was formed that the standard treatment with 1½ c.cm. of oil of chenopodium, given in two equally divided doses, with an interval between them of two hours, and the repetition of this dosage, after an interval of 10 days, is the best treatment of the disease; it is superior to treatment by 6 grammes of beta-naphthol administered on three successive days, because of greater efficiency in the removal of hookworms and other parasites such as ascaris and of its less toxic effects. The oil of chenopodium is administered in freshly-prepared gelatin capsules; care is necessary in measuring the dose of chenopodium, and this should always be done by means of a pipette and in terms of cubic centimetres. The use of this remedy for children, it is stated, needs careful medical supervision. The following are the details given by Drs. Darling and Smillie of the procedure with the treatment of hookworm patients on plantations in Brazil. The patient receives a light supper but no purge, and on the following morning 1½ c.cm. of oil of chenopodium is given, on a fasting stomach, in two doses, with an interval of two hours between them, followed about two hours later by a saline purge of magnesium sulphate in a glassful of water. When the bowels have acted the patient may take his breakfast. As has been said the treatment should be repeated 10 days later. This is generally sufficient to remove the worms; in severe cases, however, a third treatment may be necessary after a further interval, but more than three treatments need never be given. For patients who can be treated in hospital under medical supervision a modification of the above method is used, the patient getting a preliminary purge in the evening and next morning receiving 2 c.cm. of oil of chenopodium, followed by a second purge two hours later. This is reported to be slightly more efficient and gives rise to less discomfort than the first-mentioned method.

THE MECHANICS OF MICTURITION.

THE urinary bladder resembles the heart in being an enlargement of a muscular tube with fluid contents. An interesting comparison of the mechanical functions of the two organs is set forth by O. Schwarz[1] Just as in a cardiogram so in a micturition curve there are three phases: (1) The phase of getting up pressure; (2) the expulsion-time; and (3) the relaxation period. The first phase lasts until the opening of the sphincter, and during this time the bladder executes an isometric contraction. The expulsion-time begins with the opening of the sphincter and ends with its closure, and this phase represents an almost characteristic isotonic contraction. The relaxation period is introduced with the closure of the sphincter, the change of tension taking place under constant volume, the contraction again becomes isometric. In micturition as in systole of the ventricle there is an after-loaded contraction. In the heart the rise of intra-ventricular pressure in the phase of getting up pressure depends on (*a*) the filling of the ventricle (load), (*b*) the muscle tonus, and (*c*) the peripheral resistance (after-load). The same factors obtain in contraction of the bladder. In the bladder the period of getting up pressure depends on the muscle tonus and the fullness (load) of the viscus. The contractile capacity of the bladder can be altered by influencing one or other of the factors—the detrusor urinæ or the fullness of the bladder. The micturition reflex can be favoured by increasing the tonus—e.g., after injection of pilocarpine, or by increased fullness of the bladder. The occurrence of residual urine can, from this point of view, be regarded as a compensatory process; if the fullness of the bladder is greater, the necessary initial tension is more easily arrived at. Besides these analogies there are differences between the heart and the activity of the bladder. The resistance, the after-load, in the case of the heart is represented by the pressure in the circulation; in the bladder, however, by the tonus of the sphincter. The contraction of the heart is first isometric, but after the aortic valves are opened the systole is what is called auxotonic—that is, it contracts against an increasing resistance, as the arterial pressure rises. The intra-ventricular pressure overcomes the peripheral blood resistance purely mechanically, but in the bladder the opening of the sphincter is a reflex phenomenon—a physiological instead of a physical event. The author sets forth his theory of micturition somewhat as follows. The filling of the bladder discharges reflexly a certain detrusor tension. When this tension has reached a certain value, it on its part liberates a higher pre-micturition increase of pressure. The sphincter is opened reflexly (opening pressure), whereby after the beginning of micturition the pressure rises still higher (maximal pressure). These three reflexes associated with the emptying of the bladder have a causal relation one to the other. If all three reflexes act and are unimpeded or not inhibited, then there is automatic micturition.

[1] Wiener Arch. f. Klin. Med. 1920.

In voluntary emptying of the bladder the course of each one of the reflexes is inhibited by cerebral influences. The most important inhibition results in relaxation of the detrusor. If the stimulus is stronger than the inhibition there results an involuntary micturition and discharge of urine.

THE PHENOLIPOIDS.

IN THE LANCET of March 27th, 1920, we drew attention to these compounds of carbolic acid, which, according to their discoverer, possess both antibacterial and antitoxic properties. Dr. V. C. Piazza, of the University of Palermo,[1] has now made further researches on these bodies and has produced 13 different compounds of phenol with yolk of egg (lecithin) cholesterin cerebral substance and camphor. He has worked out their chemical relations and biological properties when injected into the veins or peritoneal cavity of rabbits. The most suitable of them for medical purposes are Phenolipoids H, J, and N, composed of phenol cholesterin and camphor, phenol and the ether soluble lipoid of egg yolk with camphor, and phenol and alcohol soluble lipoid of egg yolk with camphor, respectively. They present several characteristics in common, being at ordinary temperatures, mostly of semi-fluid consistence and soluble in ethylic ether, benzol, chloroform, xylol, olive and essential oils. Solutions in chloroform give an emerald-green colour reaction with concentrated sulphuric acid, changing to a more or less intense red. They are all stable compounds, and exhibit a parasitotropic action by inhibiting the development of bacteria after a certain period of contact, and an antitoxic action by neutralising typhoid anaphylotoxin and the toxins of tetanus and diphtheria. The clinical application of these compounds has been taken up by Dr. F. Aliquo,[2] who has made experiments on 46 rabbits by producing septicæmia with injections of virulent cultures of *Staphylococcus pyogenes aureus*, and then observing the action of the phenolipoids on the morbid process produced. The phenolipoid was administered subcutaneously and in some cases by intravenous injection either at the height of the infection, or simultaneously with the inoculation of the staphylococcus, or else as a preventive measure. These experiments were rigorously controlled and hæmocultures made from blood were taken direct from the heart; thus 9 of the rabbits were controls, and of the remaining 37 there were 14 deaths and 23 recoveries. From a purely clinical point of view Dr. V. Guercio[3] administered Phenolipoids H and N by subcutaneous or intramuscular injection in many cases of influenza with pulmonary complications, and claims that the results obtained were much superior to those of other methods and in severe and prolonged cases were not only brilliant, but unexpected. It appears to us that these new compounds deserve considerable further investigation, both from an experimental and clinical standpoint; apparently, in this country, they have failed to attract the attention they seem worthy of.

[1] Atti della R. Acad. delle Sc. Med. in Palermo, 1920.
[2] Annali di Clinica Medica, Anno x., Fasc. iv.
[3] Riv. Sanitaria Siciliana, Anno ix., 1921, No. 2.

AN EXPERIMENT IN POOLING SURGICAL RECORDS.

IN the last issue of *Acta Chirurgica Scandinavica* (1921, Vol. LIII., Fasc. V.) there is an editorial notice which marks a departure from the familiar paths of medical journalism. The notice begins with reflections on the present state of affairs, which permits of much waste of good material. Valuable observations often fail to get further than the surgeon's note-book or case papers. He may realise that to publish an interesting case it is desirable for him to study the literature of the subject, and for this he may have no time. Or he may defer publication of an interesting case in the hope that a similar case may turn up; this hope may never be realised, and the oblivion to which the first case was temporarily condemned becomes permanent. There are also innumerable isolated observations over which it hardly seems worth while to rush into print, although when grouped with other observations they may be of incalculable importance. With a view to drawing on these hitherto unexplored sources of knowledge the editorial staff of *Acta* proposes to constitute itself as a clearing house for odds and ends of surgical information, and once a year to publish a résumé in which the names, addresses, and nationality of the authors of this information will be given. Their contributions will be sorted out into anatomical or clinical groups, and will be reproduced in extenso or edited so as to fit in with similar observations from other quarters. It is hoped that the result of these labours will be a concise as well as a comprehensive digest, and that authors will gain rather than lose by pooling their knowledge. This yearly digest is to be published in English and will be supervised by Gunnar Nyström, surgeon to the Sabbatsberg Hospital in Stockholm. All three Scandinavian countries, as well as Finland, are represented on the staff of *Acta*, and this notice is addressed to surgeons of all four countries. It will be interesting to follow the evolution of this scheme, which, if successful, will doubtless be copied in other countries. Obviously much depends on the tact and judgment with which this surgical pool is stirred, and the sponsors of the scheme are to be congratulated on securing the services of Dr. Nyström for a very delicate task.

OPERATION FOR STRANGULATED HERNIA IN THE AGED UNDER LOCAL ANÆSTHESIA.

Dr. Martin T. Field[1] has recently made a strong plea for local anæsthesia in operations for strangulated hernia in the aged, as it eliminates many of the dangers incurred under general anæsthesia. Statistics from the larger American hospitals show that the operative mortality incident to acute intestinal obstruction, excluding strangulated hernia, has not been greatly reduced in the last 10 or 15 years, while that of strangulated hernia has. This Dr. Field attributes to earlier diagnosis, less manipulation, and operation under local anæsthesia. The last condition is particularly suitable for local anæsthesia, as, unlike other forms of obstruction, there is no need to search for the point of obstruction and it is readily accessible. In cases of inguinal hernia Dr. Field infiltrates the skin and subcutaneous tissue along the line of incision with 0·5 per cent. of novocaine and then plunges the needle down until it overcomes the resistance of the external oblique aponeurosis. About ½ oz. of solution is deposited beneath this structure in the position of the ilio-inguinal nerve. A little is also injected in the region of the external ring. After waiting a few minutes the incision is carried down to the external oblique. This structure is carefully opened near the internal ring and the flaps raised, exposing the ilio-inguinal nerve which lies on the internal oblique muscle. The nerve, which controls nine-tenths of the sensation in this region, is at once blocked by injecting it. The aponeurosis is now cut down through the external ring and also above the internal ring, exposing the ilio-hypogastric nerve, which is also blocked. The only nerve which can then convey sensation is the genital branch of the genito-crural, which lies in the posterior part of the cord. It can be blocked later, or the same result can be attained by injecting the upper part of the cord, care being taken not to puncture a vein. No more novocaine is required, except a little to render the parietal peritoneum insensitive when tying the sac. The radical operation is then performed, with or without removal of the testicle. In old persons, especially with recurrent hernia, the removal of the testicle

[1] Boston Medical and Surgical Journal, April 21st.

helps to prevent recurrence. In femoral hernia there are so many branches of nerves from all sides that the infiltration method is necessary. Gimbernat's ligament is cut or stretched with a small retractor, and when the tissues about the neck of the sac are freed the hernia can generally be reduced. After injecting a little solution about the neck the sac is tied off and resected. It is allowed to retract within the abdominal cavity, and Poupart's ligament is sutured to the pectineus muscle and fascia, including in the bite of the needle all the tissues down to the pubic bone. The wound is closed without drainage. Dr. Field reports eight consecutive cases of strangulated hernia in patients of ages varying from 67 to 90 years which he operated on with success by this method. He is certain that he could not have obtained this result with general anæsthesia. In none of the cases was resection of the bowel performed, which Dr. Field thinks should not be done unless urgently needed, as statistics show that nearly all primary resections in old people are fatal. If the bowel is hopelessly damaged it is better to drain and repair later. In some of the cases in this series there was considerable doubt as to the viability of the bowel, but in all convalescence was uneventful.

DIRECT COLOUR PHOTOGRAPHY IN MEDICINE.

THE demonstration of coloured lantern-slides at the Section of Dermatology of the Royal Society of Medicine showed the possibilities of this new method for purposes of illustration and teaching. Uvachrome diapositive lantern-slides are made from the original films employed in a new process of natural colour-photography in which no screen is employed; the minutest details can thus be projected upon the sheet without the loss in accuracy caused by disintegration of the colours. The dyes used in the preparation of the films reproduce the original colours with remarkable accuracy. The process does not lend itself to mass production, but it is found to be of the greatest value for scientific purposes.

The slides are at present prepared by the Austrian State Institute of Photography, which keeps expert photographers at the disposal of the Viennese hospitals and clinics, so enabling accurate colour photographs to be made of cases of special interest. The negatives provide a record for the hospital archives, and furnish medical lecturers with the slides of individual subjects which they need. It is proposed to carry out the same work in England for the benefit of medical authorities in the hospitals and universities. If, as the makers claim, the films can be satisfactorily reproduced on paper, they should prove very valuable for use in text-books and in original articles on rare diseases.

THE DIAGNOSIS OF TUBERCULOSIS IN CHILDHOOD.

IN a paper read on April 12th at a meeting of the London Association of the Medical Women's Federation on the subject of Tuberculosis in Children of School Age, Dr. Jane Walker gave instructive figures and interesting comments thereon. In a report on these figures in THE LANCET of April 23rd a clerical slip occurred, and it should be noted that of the 807 children referred to 8·4 per cent. (not 62 per cent.) were sputum-positive. Even more important than her statistics was the broad and philosophical spirit in which she approached her subject. In science, as in religion, the best guarantee of fitness to advance is a broken and contrite spirit. Dr. Walker tempered her candid agnosticism with shrewd hints on how to emerge from this healthy but barren state. As her survey showed, the incidence of tuberculosis among school children has been variously estimated at 0·7 per cent. to 96 per cent. An intermediate calculation is that made by Sir Robert Philip, who considered that not less than 30 per cent. of school children bear the stigmata of tuberculosis. We may to a certain extent whittle down this glaring disparity by regarding the lowest figures as indicating actual disease, and the highest as referring only to infection without great morbid change. But such an arbitrary expedient for conciliating contradictory statistics is plausible only on the surface; it soothes too much and stimulates too little. If we accept the outside figure of 96 per cent. as being the measure of tubercle infection among school children at the age of 12, we are still as much in the dark as ever in forecasting the ultimate fate of these children. All we can say for certain is that the majority will not succumb to tuberculosis. Even for the remaining 4 per cent. who, at the age of 12, are, biologically speaking, "virgin soil" we can cast no accurate tuberculosis horoscope. The next generation will be better off in this respect, for in a few decades valuable information should be available as to the expectation of fatal tuberculosis for each person who has been periodically tuberculin-tested since infancy. Meanwhile it is the obvious duty of all concerned with the medical supervision of children to make and preserve careful tuberculin records, so that in due time we may clearly read into the tuberculin tests diagnostic, therapeutic, and prognostic knowledge which is at present withheld from us. Even now there are aids to diagnosis which can be interpreted with considerable clearness, and in emphasising the importance of the X rays, Dr. Walker consciously or unconsciously censured the many large institutions in this country which are satisfied to continue dispensing with this important weapon.

BENIGN GASTRIC ULCER IN SYPHILIS.

Dr. W. Frank Fowler,[1] of Rochester, New York, remarks that in spite of the publication of numerous papers on the various phases of gastric syphilis no case has hitherto been recorded of non-specific ulceration in the stomach of a syphilitic, although several writers such as Einhorn, Niles, Eusterman, and Morgan have indicated the possibility of this occurrence. The gross lesions of gastric syphilis have been classified by Eusterman into (1) gummata in various forms, (2) diffuse syphilitic infiltration. The degeneration of gummata gives rise to specific ulceration, the symptoms of which differ from those of benign ulcers, chiefly in the absence of relief of pain by food and alkalis, less periodicity, anacidity, vomiting with good appetite, excessive loss of weight, and improvement in the gastric function under specific treatment. Apart from operation the diagnosis usually rests on a past history of syphilis, the presence of signs of late syphilis, a positive Wassermann reaction, and the therapeutic test. On the other hand, it must be borne in mind that a negative Wassermann reaction does not exclude syphilis, and that a positive reaction does not prove that a gastric lesion is specific. The therapeutic test though usually reliable is not infallible, as antisyphilitic drugs sometimes favourably influence non-specific conditions. X ray evidence is not conclusive, as we may have close simulation of carcinoma. Even exploratory operation may not be decisive, and cases are on record where gastro-enterostomy has been performed for the relief of syphilitic gastric ulcer. Microscopical evidence consists in characteristic syphilitic obliterative endarteritis and perithelial lymphocytic infiltration with atrophy of the mucous membrane, and hypertrophy of the submucosa and muscularis. Dr. Fowler's case was that of a woman aged 26, who had been suffering from symptoms of gastric ulcer for eight years and presented evidence of secondary syphilis. The Wassermann reaction was 4 +, and she was given a course of specific treatment. No improvement, however, followed, and gastro-jejunostomy was performed with the result that relief was obtained for seven months. The symptoms then recurred and laparotomy was again performed. A large callous ulcer of the usual benign type was found on the posterior wall of the stomach adherent to the pancreas. The pyloric half of the stomach was

[1] Surgery, Gynecology, and Obstetrics, May, 1921.

removed, and the old opening in the jejunum was anastomosed to the gastric stump. Uncomplicated recovery took place.

EARLY DIAGNOSIS IN DIPHTHERIA.

THE importance of early diagnosis in diphtheria and of the administration of effective doses of antitoxin as soon as possible is generally recognised. It comes, therefore, as a surprise to find that Dr. Frederic Thomson, of the North-Eastern Hospital, Tottenham, in the interesting letter published in THE LANCET last week, has noticed that for the past two years many patients have been arriving at his hospital rather later in the disease than was formerly the rule and often without antitoxin treatment. He suggests that this delay in sending patients to the special hospital is largely due to practitioners waiting for the results of bacteriological examination, and he strongly deprecates this being done. He urges that antitoxin should be given without delay if the clinical evidence favours diphtheria. He points out that failure to find the bacillus in cultures taken early is not uncommon, that cultures taken on the first day even from cases of the several faucial diphtheria are frequently negative, also many of those from purely laryngeal cases. On the other hand, a positive result may be due to the case investigated being a diphtheria bacillus carrier. Dr. Thomson's letter is worthy of the special attention of our readers, since the advice he gives is of practical importance, and the point he raises in regard to the bacteriological evidence is one of great interest. There is a tendency in the minds of some practitioners to regard the evidence afforded by laboratory investigation as incontrovertible and infallible, whereas it should be assessed in the light of the other evidence and its indications placed in their true perspective. The importance of Dr. Thomson's suggestion is emphasised by his statement that the death-rate among his cases in 1919 and 1920 was higher than it had been for many years, while he is not prepared to admit that the type of the disease had been much more severe.

MATCH-BOX DERMATITIS.

THE substitution products employed in Germany during the war and still in use have given rise to a number of hitherto unknown skin diseases to which must now be added match-box dermatitis. This condition, of which Dr. Herbert Stranz,[1] of Breslau, has seen sixteen examples during the last six years, is most frequent in the male sex. His cases occurred exclusively in heavy smokers who were in the habit of carrying a match-box in their trouser pocket. In typical cases the eruption begins on the upper third of the front of the left thigh, occasionally on the right thigh or both thighs at once, as well as on the adjacent part of the hypogastrium and hips, and then attacks the backs of both hands and the face. Experiments made by Frei, in Jadassohn's clinic at Breslau, showed that the dermatitis was due to the presence of the sesquisulphide of phosphorus, which has been used as a substitution product on the striking surface of match-boxes since the beginning of the war. The warmth of the body sets free the irritating substance in the form of a vapour which attacks the skin lying beneath the trouser pocket, and the backs of the hands and the face subsequently become affected. The clinical picture of match-box dermatitis varies with the extent and age of the lesions and the special sensitiveness of the individual. Occasionally only a slight circumscribed erythema is seen resembling erysipelas. But in many cases an exudation takes place with the formation of crusts. In one of Dr. Stranz's cases the œdema was very pronounced. In long-standing cases the condition resembles chronic lichen. Even in mild cases there is very severe itching and burning pain, and the patient suffers generally owing to loss of sleep. Unless the cause is recognised the condition is liable to last for years. Treatment consists in applying compresses of 1–2 per cent. boric or resorcin solution. Dr. Stranz has also obtained good results from the use of X rays owing to their anti-pruriginous action.

[1] Münchener Medizinische Wochenschrift, May 6th, 1921.

HOSPITAL PHYSICIAN AS SANITARIAN.

THE retirement of Dr. William Hunter from the active honorary staff of Charing Cross Hospital gave his colleagues and friends opportunity to express, not only their warm personal regard, but their ungrudging admiration for his services to his hospital and medical school, to medicine, and to the public health. The occasion was a complimentary dinner given at the Imperial Restaurant on Friday, May 20th, at which Mr. George Verity, chairman of Charing Cross Hospital, presided. Dr. Hunter's association with the hospital covers the period during which financial difficulties were met and overcome, and his term of office as dean initiated a similar period of prosperity in the medical school attached to the hospital. His work on oral sepsis established its importance as a forerunner of chronic ill-health, an association now generally recognised. Fortunately it has been given to many hospital physicians to combine fruitful clinical and experimental work with administrative achievement, but to Dr. Hunter's credit is a third exploit in a larger field, when within a few months he was instrumental in ridding the Serbian army in the field of typhus and relapsing fever, and this by means of simple appliances of universal application. The recent exhibit of sanitary appliances at the Royal Army Medical College (see page 1133), it may be noted, included a sack disinfector which carries the principles of Hunter's Serbian barrel into the home. Medicine is one and indivisible, and the equipment of a successful clinician, medical administrator, and sanitarian is not dissimilar in essentials.

URBAN VITAL STATISTICS.

(Week ended May 14th, 1921.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate population estimated at 18½ million persons, the annual rate of mortality, which had been 12·5, 12·5, and 12·4 in the three preceding weeks, was 12·5 per 1000. In London, with a population of 4½ million persons, the annual rate was 11·6, against 11·5 per 1000 in the previous week, while among the remaining towns the rates ranged from 4·7 in Dewsbury, 5·7 in Grimsby, and 5·9 in Walthamstow, to 20·0 in Oldham, 21·2 in Exeter, and 24·3 in Barnsley. The principal epidemic diseases caused 227 deaths, which corresponded to an annual rate of 0·6 per 1000, and comprised 71 from whooping-cough, 50 from diphtheria, 48 from infantile diarrhœa, 43 from measles, 11 from scarlet fever, and 4 from enteric fever. Measles caused a death-rate of 1·3 in Sunderland and in South Shields, and 1·4 in Barrow-in-Furness, and whooping-cough of 1·1 in Liverpool and in Oldham, and 1·5 in Burnley. There were 3238 cases of scarlet fever, 2281 of diphtheria, and 1 of small-pox under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital, against 3195, 2343, and 1 respectively at the end of the previous week. During the week ended May 7th 6 cases of encephalitis lethargica were notified in the County of London, from Camberwell, Chelsea, Hammersmith, Southwark, Stepney, and Wandsworth respectively. The causes of 28 of the 4434 deaths in the 96 towns were uncertified, of which 10 were registered in Birmingham and 3 in Gateshead.

Scottish Towns.—In the 16 largest Scottish towns, with an aggregate population estimated at nearly 2¼ million persons, the annual rate of mortality, which had been 14·6, 15·0 and 14·7 in the three preceding weeks, fell to 14·3 per 1000. The 339 deaths in Glasgow corresponded to an annual rate of 16·1 per 1000, and included 25 from whooping-cough, 3 from measles, 2 each from diphtheria and infantile diarrhœa, and 1 from scarlet fever. The 101 deaths in Edinburgh were equal to a rate of 11·8 per 1000, and included 3 each from whooping-cough and diphtheria, 2 from infantile diarrhœa, and 1 from measles.

Irish Towns.—The 137 deaths in Dublin corresponded to an annual rate of 16·9, or 1·8 per 1000 below that recorded in the previous week, and included 4 from infantile diarrhœa and 1 from diphtheria. The 121 deaths in Belfast were equal to a rate of 15·0 per 1000, and included 9 from whooping-cough, 2 from infantile diarrhœa, and 1 from diphtheria.

SOME EFFECTS OF ALTITUDE ON THE HUMAN BODY.

BY A. REEVE HEBER, M.D., CH.B. BRISTOL.

SINCE the year 1800 a good deal of work has been done on testing the effects of altitude on the human body, and during the war the choice of men for the Flying Corps has made such work most important. The writer having lived for about six years at an altitude of 11,500 ft. in Leh, the capital of Ladak, one of the provinces of Kashmir, found himself able to test the chronic effects of residence in altitudes.

The country in which I worked is situated in the Himalayas, and is very cold during the winter and very hot during the summer, but both cold and heat are less felt on account of the extreme dryness of the atmosphere. During the summer the power of the sun is immense; an ordinary thermometer exposed to the sun on an ordinary day (30/7/20) at 12.15 P.M. registered 108° F. The report of the Meteorological Department of India gives the following temperatures for the year 1914:—

Mean temp. of year	37·5° F.
Mean maximum temp.	54·5° ,,
Departure from normal of year	0·9° ,,
Mean minimum	29·8° ,,
Departure from normal	0
Yearly mean of mean between max. and min.	42·2 ,,
Departure from normal of year	0·4° ,,
Mean daily range of temp.	24·7° ,,
Highest temp. observed during year	86·3° ,,
Lowest temp. observed during year	1·2° ,,
Absolute range during year	87·5° ,,
Mean monthly absolute range	42·4° ,,

With regard to the extraordinary dryness, the Indian Meteorological Report for 1914 gives the following figures:—

Mean humidity of year	0·53
Departure from normal	0·1
Rainfall for year	3·84 inches
Normal rainfall for year	3·26 ,,

There is very little wind in the winter and the air is very calm, but during the spring we get what are called the "Spitlung," which, coming from the snow regions, are bitingly cold. The prevailing wind is from the south, and has a comparatively great average speed.

The barometric pressure is the most important factor in determining the effects of altitude on the human body. The figures for Leh for 1914 are as follows:—

Elevation of bar system above sea-level	11,503 ft.
Highest pressure recorded during year	19·983 in. Hg.
Lowest pressure recorded during year	19·340 in.
Absolute range during year	0·644 in.
Mean monthly range of pressure	0·579 in.

It will be noticed that in Leh the glass is fairly stable. The boiling-point is lowered proportionately, and for Leh is 183·6° F., a fact soon realised when trying to make a good cup of tea. By comparison with Major J. L. Birley's second Goulstonian lecture,* the proportion of oxygen at this altitude should work out at about 13 per cent., and shows its effects chiefly as one would expect, in the respiratory, circulatory, and nervous systems.

The people among whom I worked were mostly Ladakis, who are really Tibetans, but I was also able to test a fair number of Yarkandis, down-country Indians, and about four English men and women (two of each), all of whom were resident in Leh for longer or shorter periods. The religions of these various people were almost equally diverse, as they belonged to the Buddhist, Mahommedan, Hindu, Christian, and Sikh persuasions.

It is most difficult to arrive at merely an approximate figure for the population of Ladak as no census has been taken for many years. There would be about 8000 inhabitants in Leh and about 150,000 inhabitants in the whole of Ladak. The greater number of these are Buddhists, but about 300 are Mahomedans, which enumeration closely adheres to the Mahomedan custom of not counting their women. Most Ladakis are farmers, though in Leh itself one finds a few traders and a small number of artisans.

* THE LANCET, 1920, i., 1205.

General Considerations.

During short stays in altitudes the European seems to be fairly healthy, but it seems to me that the "altitude of happiness" varies for each individual. I am quite comfortable at 11,000 ft., a good deal less so at 14,000 ft., but on going higher feel fitter again. In 1913 Sir Filippo de Filippi brought a scientific expedition to Leh. His second-in-command never felt well in Leh, but on getting higher was quite fit. This fact was also noticed by Barcroft, who says, "Why did I become acclimatised at once on Monte Rosa when I did not at Teneriffe? and, secondly, why did Douglas acclimatise at Teneriffe when I did not do so?" This fact is rather difficult to explain, for although acclimatisation may have a good deal to do with it, yet in the second instance quoted above there was ill-health, even after several weeks' time in Leh, during which acclimatisation should have taken place, yet immediately on going higher, when such adaptation had not been obtained, improvement occurred. Europeans living in Ladak are usually very fit physically, and even after prolonged residence would be quite healthy, if only their nervous systems were equal to the strain, but this is the weak link in the chain. It has also been noted that the longer the European stays in Leh the more he feels the cold.

The natives are generally very healthy, but when serious disease of any kind does supervene collapse and death occur very rapidly and suddenly. They are not quite as long-lived as the lower-living races. The infant mortality is appalling, and the writer found that of 848 children born 310 died, a mortality of over 36·5 per cent.; but this is due mainly to neglect and not primarily to altitude, for among the few European children who have lived in Leh the mortality is a good deal less. It is simply impossible to establish the cause of death, which is generally stated to be "fever." The heights of about 160 Ladaki men and women was measured, and it was found that they are on the whole shorter than English men and women of the same ages, but it takes the Ladaki about the same time to attain his full stature, and while the Englishwoman's height tends to decrease after the age of 22 years, her Ladaki sister steadily increases in height until she reaches her fortieth year.

Respiratory and Circulatory Systems.

The power of "holding one's breath" is seriously curtailed, and in 52 cases this was found to vary between 40 and 19·7 seconds, the former figure being for the writer himself, and the average for all working out at only 27 seconds. This is all the more surprising when Major Birley found that at an altitude of 10,000 ft. a man should be able to hold his breath for 71 seconds.[1] One wonders whether this is directly due to prolonged residence in altitudes. It was further found that the European who has lived for some time in Ladak, and the native born there, find breathing distinctly easier than those who have just arrived in the country. It is also interesting that the statement "all men are mouth-breathers above 12,000 ft." is not true of people who have spent some time in the heights. I have crossed the Kardong Pass, which is 17,400 ft., and, except during and immediately after exertion, breathed through the nose. This is due, no doubt, to the fact that the lungs themselves expand to meet the altered physical conditions. I heard that a former doctor in Leh had definitely stated that his chest had enlarged during his stay in the country. Dr. Kathleen Heber found that during her first two years there her thoracic outlet had expanded 2 in., although her actual body was thinner. The same kind of statement is made by almost every European who has lived there. During 1920 I accompanied a lady from Srinagar (5000 ft.) to Leh and took measurements of her chest just under the axillæ, immediately below the nipples, and at the thoracic outlet, and again five weeks later after a three weeks'

stay in Leh (11,500 ft.) and found that during this time her chest had expanded ½ cm. in each position. Although one cannot base any conclusions on this one case, yet it does show the tendency. In this connexion it is of interest that the chests of the natives measured (over 150 cases) were on the average smaller than those of the Europeans. This expansion of the chest is evidently consequent on an expansion of the lungs, for in the 160 cases examined it was found that the area of superficial cardiac dullness is distinctly lessened—viz., the upper border is shifted down to the fourth intercostal space or even the fifth rib, its left border moves in to 2½ and 2 inches from midsternum, and although the right border is found at the left border of the sternum, yet even here there is a tendency to overlapping of the heart. In the examination of hearts in Ladak, it is striking that in so comparatively few cases the apex beat of the heart is seen, which would also be accounted for by increase of lung tissue. The liver, too, seems to be pushed down a little; in the greater number of cases examined the upper anterior border was found at about the sixth rib. The rate of respiration is increased, and for corresponding ages in England varied from a quarter to three and a quarter breaths per minute, whilst the proportion of respiration- to pulse-rate is a little higher than 1:4—i.e., the respiration-rate has increased slightly more than the pulse-rate.

The fact that anoxæmia causes periodic breathing has long been known, and is found to exist even when Europeans have lived in the country for some years, especially when ascending the mountains. My little hill pony, which was born in Zankskar, the most highly situated province in Ladak, exhibits it when going up steep hills. The pulse-rate also tends to be a little higher than in England, varying from 2-12 beats per minute. Dr. Kathleen Heber noticed that her own pulse averaged ten beats quicker in Leh than in Srinagar, which is over 5000 ft. lower. It had often seemed to the writer that the pulse-rate increased much more rapidly with increase of the temperature than in England, and he therefore investigated his temperature charts, but found that for every rise in temperature of 1° he got on an average an increase in the pulse-rate of 7·2 beats per minute, which is about normal even for England.

In respect to blood pressure, tests made on about 200 patients gave the interesting result that between the ages of 22 and 65 years the average blood pressure is even lower (118·9 mm. Hg) than the minimum (120 mm. Hg) which is usually given for Englishmen. At other ages the figure is somewhat higher, but as these only represent about 15 per cent. of the subjects tested, they are not nearly so reliable as the figures for the ages 22-65 years. This fact harmonises well with the findings on airmen that prolonged flying in altitudes tended to lower blood pressure. The pulse pressures obtained in Leh showed a definite increase, and this was more marked in the women than the men, this increase being 8·6 higher for men, to 12 mm. Hg for women, as compared with those in England. This is chiefly due to a fall in diastolic pressure, and again agrees with conditions found in our airmen in France.

The heart itself is not enlarged upwards nor to the left, but there were quite a number of cases in which the heart had enlarged to the right (of the 160 cases tested 27 per cent. had enlarged to half an inch to the right of the right sternal border), which is not surprising. As the atmosphere contains less oxygen the heart has to pump more blood into the lungs, but the blood pressure being lower in Ladak the left heart does not need to enlarge in order to eject a larger blood stream. Red blood counts were done on over 50 people, consisting of Ladakis, Downcountry Indians, and five Europeans. The average blood count for all the men of these is 6,816,454 per c.mm., which is somewhat below the figure at which Major R. W. G. Hingston arrived in his investigations in the Pamirs. The Ladak figure is slightly smaller than his on account of the striking fact that the men born in the country had a lower count than the Downcountry Indians and Europeans. Among the women the same is true, and in both male and female there were over a million more red cells per c.mm. than in those born in the country. We can state, therefore, that altitude raises the blood count, but to a lesser degree in those born in the country than those from lower altitudes. Leucocyte and differential leucocyte counts did not show much variation from the normal for England. When, however, the investigations on the hæmoglobin percentage were begun, it was thought that the results would prove a good deal higher than in England, and it was all the more surprising to find that the percentage was well below 100. This was true of all sorts and conditions of men and women in the country, and, whether born there or in the lowlands, the figures approximated very nearly to 90 per cent., the former being just over and the latter just under. It is difficult to account for this, and it may be suggested that a *prolonged* stay in altitudes tends to destroy hæmoglobin.

The human body, therefore, seems to respond to decreased oxygen-tension in the atmospheric air of altitudes by a small increase in the rate of both respiration and pulse, whilst the lungs and, in consequence, the chest, expand; further, the heart tends to enlarge to the right, the work of the left ventricle being made lighter by a decreased blood pressure. An increase in the oxygen-carrying powers of the blood is made possible by an increase in red blood corpuscles, which is greater in the downcountry man than in the native inhabitant. Finally, the first response to a rapidly decreasing oxygen pressure consists in periodic breathing.

Nervous System.

The European on first arriving in Ladak feels most extraordinarily fit—he sleeps well, he eats well, and feels himself equal to almost anything. The journey itself, which is accomplished in 16 short stages, either on horseback or on foot, tends to cause this exhilaration. But, sooner or later, it gives place to a terrible weariness of the brain, sleep becomes difficult to obtain, interest in food is lost, and even a short day's work produces great weariness, especially if that work is mental, and in spite of the fact that the rest of the system is in good order. But even when this condition has been reached, there is still a short period during the morning in which the brain is keenly active, and during which work is a real pleasure. This deterioration is, however, not as serious as that in one's temper and all the other subjective functions of the brain. It is astonishing how even the most decisive man slowly and insidiously loses the power of decision and becomes unwilling to bear responsibility. Things are not improved by the fact that the memory suffers also, and sometimes it almost seems as if morals were affected too. Peripherally, altitude showed its effect on the nervous system of Europeans by causing numbness and tingling of the limbs much more rapidly than at home.

Alimentary System.

That the human body needs more sugar and butter when in altitudes is a well-established fact, and even the native needs and obtains these by drinking endless butter tea and eating cereals. All Europeans suffer from the most appalling intestinal flatulence which it is difficult to explain, unless the decreased oxygen pressure stops the intestines from breaking up the foodstuffs into their end-products. One of the commonest of native maladies is sthenic dyspepsia, which must in great part be due to the fact that the boiling-point of water (183°6 F.) is insufficient properly to break down the starch granules.

Reproductive System and Special Organs.

The European birth-rate does not seem to be much affected. In passing, the writer would like to remark upon the rapidity with which delivery occurred. He had to conduct three confinements of Englishwomen up there, and found that the two primiparæ took three and a quarter and four hours, whilst one multipara took five hours. The native women marry early in life, the average age in 730 women being 14·4 years. The Ladaki birth-rate is extremely low; thus, 828 women between

them only had 848 children. This is, in the author's opinion, not primarily due to altitude, but to syphilis. One would think that early marriage would lead to early menstruation, but, as a matter of fact, the average age at which 799 girls began to menstruate was 15 years, whilst with 195 women the menopause set in at 39·2 years, thus greatly shortening the bearing age of Ladaki women.

The Ladaki is, on the whole, very hairless, although actual alopecia is practically unknown. On account of the extreme dryness of the air, the skin desiccates badly and cracks, especially during the winter months. The hair becomes straight and lustreless and tremendously electrical. Eczema and chilblains, on the other hand, are very rare.

Notes on the Incidence of Disease.

Although "rheumaticky" pains are very abundant, yet true rheumatism or rheumatic fever is practically unknown. Again, coughs and colds have to be treated almost continually, and yet accute lung disease is comparatively rare, whilst tuberculosis hardly ever occurs. This can be accounted for by the fact that the air is so dry and free from micro-organisms. The manifestations of syphilis are peculiar, for, whilst the first stage is common, and also the skin manifestations of the second, it does not go further, and the later secondary and tertiary symptoms do not occur. Since the writer first went to Leh he has never seen a case of gumma there. One wonders whether the lowered blood pressure has anything to do with this. It was noticed that almost always those who registered merely relatively high pressures had suffered from syphilis. Furthermore, the parasyphilitic manifestations practically never occur. Similarly one sees a good deal of gonorrhœa, but strictures do not often result. In Kashmir, osteomalacia is very common, but in Ladak it does not occur.

Conclusions.

1. High altitude makes for health in both native and European, until in the latter the nervous system begins to break down. 2. The most serious effects of a long stay in altitudes are felt by the nervous system, and correspond with the acute effects observed in airmen. 3. Altitude has a tendency to enlarge the right but not the left side of the heart. 4. Altitude decreases the blood pressure, but increases the pulse pressure. 5. In altitudes the thorax expands and the lung tissue increases. Breathing is somewhat accelerated, whilst the power of holding one's breath is much curtailed. 6. In altitudes an increase of red blood corpuscles occurs, but this is more marked in those who have come from lower altitudes than in the indigenous population. The white blood count and the differential blood count remain much the same as in England. 7. Prolonged residence in altitudes does not increase, but rather decreases, the hæmoglobin percentage. 8. In Leh human fertility is decreased, whilst menstruation begins later and ends earlier.

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IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Government Grants and the Health Services.

LAST summer, in view of the refusal of many local authorities in Ireland to strike rates for the purpose of meeting claims made on account of malicious injuries, the Government obtained power from Parliament to withhold Government grants ordinarily payable to local authorities, and to devote the funds thus held to meeting the claims for malicious injuries. At the same time many of the local authorities had debarred themselves from receiving grants by refusing to submit their books to audit by the Local Government Board. It was hoped that if they consented to the audit the grants would be forthcoming, and only last month the Vice-President of the Local Government Board assured a medical deputation that, so far as he knew, the refusal of audit was the only obstacle in the way of local bodies receiving their grants. Last autumn both the Irish Public Health Council and the delegates' meeting of the medical profession had put forward the suggestion to the Government that in any dispute which might arise with local authorities the health services should be immune and that grants ordinarily devoted to care of health should not be diverted to other purposes. The suggestion was treated with scanty consideration by the Chief Secretary, and last week the Government carried its threat into effect. By an Order made under the Restoration of Order in Ireland Act, it is directed that "with a view to making provision for the immediate payment of amounts recovered by decrees" against certain local authorities, no payment is to be made to these local authorities out of the Local Taxation (Ireland) Account, or out of any Parliamentary grant, or out of any fund administered by any Government department or public body. The names of over 250 local authorities of various classes are included in the Order.

This Order makes it clear that the funds are no longer merely held up pending an audit, but that they are to be definitely diverted to other than their customary purposes. The position as regards many of the health services becomes at once precarious. Out of the Local Taxation Account comes a State subvention toward the salaries of Poor-law officers including dispensary doctors. The subvention was originally supposed to pay half the salaries of the dispensary doctors, but as the Local Taxation Account has dwindled, and the salaries have increased, of recent years it only paid about one-fifth. The deprivation of even a fifth of his salary is, however, a serious blow to an already ill-paid doctor, who is entirely blameless as regards the genesis of the present state of disorder. It will be interesting to see whether, now that the Government has repudiated any responsibility for the payment of Poor-law officials over the greater part of the country, the Local Government Board will continue to attempt to exercise control over their performance of duty. Up to the present it has, regardless of the personal danger to which obedience would expose a dispensary doctor, continued to press him to make the usual formal returns to the Board.

The National Relief Fund and Irish Hospitals.

Out of the residue of the National Relief Fund granted to hospitals in the United Kingdom, £63,000 have been allotted to Ireland. Its distribution was in the hands of an influential committee of eight, presided over by the Rt. Hon. the Master of the Rolls. After deliberation the committee decided to adopt as a principle of distribution the relative number of "free beds" maintained by the several hospitals. The principle appears fair, but there must be considerable difficulty nowadays in defining a "free bed," since all patients are expected, as far as they are able, to contribute to the cost of their maintenance.

Dublin University Election.

The nomination of candidates to represent Dublin University in the Parliament of Southern Ireland took place on May 13th, and, four candidates only being nominated, they were declared elected. They are Mr. E. H. Alton, a Fellow of Trinity College and a classical scholar of distinction; Sir James Craig, King's Professor of the Practice of Medicine and President of the Royal College of Physicians; Mr. G. FitzGibbon, K.C., of the Irish Bar; and Mr. W. E. Thrift, a Fellow of the College and Professor of Natural and Experimental Philosophy. These four gentlemen had been requested by the teaching staff of the College and University to permit themselves to be nominated and electors will probably feel grateful to them for their willingness to serve their university in a difficult position. At the same time, electors are likely to hope that in future the teaching staff will not by any collective action attempt to influence the freedom of choice of the constituency.

Students at Irish Universities.

A Blue-book issued last week gives some information as to the number of students attending the National and Belfast Universities. The total number of students is 3130, distributed as follows: Belfast, 995; Cork, 608; Dublin, 1268; and Galway, 259. Of this total more than half—1752—are studying medicine or dentistry.

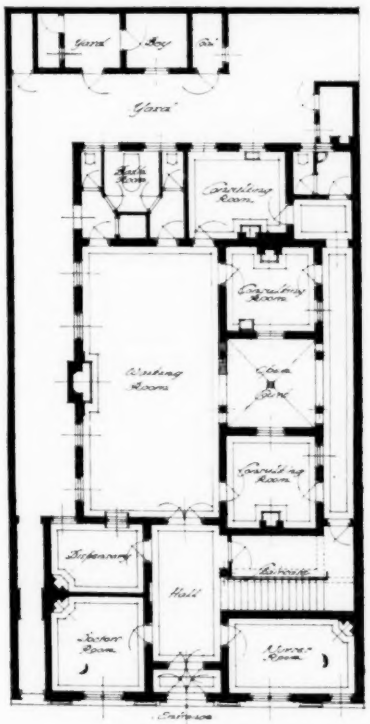
THE JOHANNESBURG SCHOOL CLINIC.

SINCE the inception of medical inspection of schools in the Transvaal in April, 1914, the necessity for an up-to-date school clinic for the largest urban area in the Province has been recognised by the Education Department. Sanction for the establishment of such a clinic was given early in 1915, but the interruption caused by war conditions and the excessive increase in the cost of building material, added to the fact that it was exceedingly difficult to obtain a satisfactory central site, necessitated the postponement of the original scheme. In 1918, however, a suitable site was obtained, within easy access of the schools and yet centrally situate, and plans were drawn for the building by Mr. Cleland, of the Public Works Department. Owing to the limitations of the site—100 by 50 feet only—the design had to be carefully considered in order to obtain the maximum working accommodation and amount of light and air. The clinic is claimed to be the finest of its kind in existence, and is probably the only one in Africa. The building, now completed, is a double-story block, of brick and reinforced concrete, with stone facings and a simple but dignified Georgian façade facing Jepe-street. The roof is of tiles, with square tiled chimneys at both ends; the flooring in all consulting- and work-rooms is of magnesite composition; in the corridors and hall it is of tiles, and the operating room has a floor of cement. The inside walls and ceilings are painted throughout with non-absorbent porcelain white, and the building is fireproof.

On the ground floor a small entrance porch gives access to a lobby which opens into the large waiting-room, which will also be used as a lecture and demonstration room. On the right of the entrance lobby are a nurses' common room (also to be used as a work-room), a fireproof record room, and the open staircase leading to the first floor. On the left are a doctors' sitting-room and a small dispensary. On the right of the waiting-room are three large consulting-rooms, each with a door opening on to the outside corridor, so as to give separate entrance and exit to patients. At the end of the waiting-room are lavatories and bathroom for patients and a private lavatory for the staff. Separate from the main building, in the small yard behind the block, are the native servants' quarters, with bed- and bath-room, the store room, coal shed and boiler room. On the first floor are large and exceedingly well-lighted operating rooms, one for the dental inspectors and the other for nose and throat operations. Between them is a small anæsthetist's room. Next to the main operating room is the eye room, which is flanked by a small linen room. A main corridor, terminated at the north end by a safety staircase, runs the length of this floor. On its right are two consulting-rooms, a kitchen, scullery and larder; on the left are a nurses' bedroom, and a small four-bedded ward for emergency cases, with bathroom and lavatory accommodation. The attached plan shows the general design of the building.

As the latter is flanked on the right by a three-storied block of residential flats, which cuts off much of the light, it was somewhat difficult to obtain adequate lighting and ventilation in the large waiting-room. The difficulty has been largely overcome by converting half of the available space on the right, between the two consulting-rooms, into an open porch. Ample window space has been provided in all rooms, the austral type of window being used, and additional light has been obtained by whitening all walls. The building is heated by open fireplaces in all rooms, but provision is also made for central heating if necessary. Furniture for the clinic is being made locally, and as teakwood has been exclusively used in the building, all wooden furniture will be of teak. Equipment has been ordered from Europe, and the Education Department is indebted to Dr. J. A. H. Brincker, of the Public Health Department of the London County Council, and to Mr. N. Bishop Harman and Mr. G. F. C. Wallis for help in selecting such equipment.

It is intended that the clinic shall be the staff headquarters of the school medical inspection service, and, as such, a central bureau for inspection and treatment. Dr. Anne F. Cleaver, assistant medical inspector, will be in charge of the clinic, and Nurse Hassall, assisted by 10 school nurses, will have charge of the nursing arrangements. A psychological clinic has been arranged for under the direction of



Johannesburg School Clinic: Ground-floor plan.

Dr. J. M. Moll, the departmental psychiatrist, and other branches of clinic work will be a maternity department (prenatal clinic), a baby clinic, and a department for advising leavers and dealing with physically defective children. The treatment clinic will, in the terms of the arrangement made with the profession in 1915, be staffed by a panel selected by the practitioners on the Rand, the dentists selecting a similar panel. Treatment will be given free to all necessitous patients for defects of the eyes, teeth, nose and throat, and for minor ailments, practitioners being paid a nominal honorarium calculated on the basis of one guinea per hour of work. These arrangements are, however, subject to modification if the profession prefers that part-timers—as is at present the case—should be employed. The clinic will be open during vacations as well as during term, and it is hoped to make it a propaganda centre for social and public hygiene. For that purpose the waiting-room has been specially fitted up to enable the kinematograph to be used for lectures.

THE GENERAL COUNCIL OF MEDICAL EDUCATION AND REGISTRATION.

THE opening of the summer session of the General Medical Council took place on May 24th, under the presidency of Sir Donald MacAlister.

The President's Address.

Sir DONALD MACALISTER commenced his address by referring to the deaths since the last session of two former members of the Council, Sir Frederick Taylor and Dr. R. J. Pye-Smith, the lives of both having been shortened by the sorrows and labours of the great war. He continued:—

Medical Reciprocity.—Through the Privy Council we have been in correspondence with certain foreign countries and dominions of the Crown on this subject. *Belgium*, which, during the war, granted to British practitioners the privilege of practising within its territories, was by Order in Council accorded corresponding privileges under Part II. of the Medical Act, 1886. Its medical graduates were accordingly made registrable in the British Foreign List, and some 104 were duly registered. The Belgian Government has now decided to reinstate its former medical regulations, which require our practitioners to obtain a Belgian qualification as a condition of practice. The conditions of reciprocity being therefore no longer maintained, His Majesty in Council has issued an Order revoking the application of Part II. to Belgium, and Belgian practitioners will in future be registrable only in respect of British qualifications. Those already registered will, however, retain their status in this country.

In *Spain*, the law has hitherto provided that individual foreign practitioners may, under certain conditions, obtain special permission to practise in that country. A change in the law is, however, in contemplation, and the British Ambassador has suggested that His Majesty's Government may see its way to granting reciprocity. The Executive Committee has requested that inquiries may be made as to the privileges which would be granted in Spain to practitioners registered in the United Kingdom, and as to the course of study and examinations prescribed for obtaining medical degrees and diplomas in Spain. We await the result with interest.

The *Union of South Africa*, which admits to its Medical Register practitioners registered in the United Kingdom, has within the last few years made much progress in developing its own system of medical education. Its universities have obtained power to confer degrees in medicine and surgery, and the Union is desirous that these degrees should, in due course, be recognised as registrable qualifications at home. The Executive Committee, to which the Council has delegated the supervision of such matters, has had no difficulty in advising the Lord President that Part II. of the Medical Act may properly be applied to South Africa, and it is probable that before long the necessary Order in Council will be issued. The Council will then be free to recognise South African medical degrees which fulfil the prescribed conditions.

For many years the medical diplomas of the *Indian Universities* have been recognised by the Council as conferring a registrable qualification to practise medicine, surgery, and midwifery in this country. Recent inquiries by the Executive Committee have, however, caused the Committee to raise the question of their present sufficiency in respect of midwifery. The information received from India has satisfied the Committee that in most, if not all, of the Indian Universities the prescribed courses of study and examinations in this important branch do not now furnish (in the words of the Medical Act, 1886) "a sufficient guarantee of the possession of the requisite knowledge and skill for the efficient practice" of midwifery in the United Kingdom. The Committee has communicated its opinion to the Indian Universities, and intimated that unless within a year the standard of their requirements in midwifery is raised to a satisfactory level, recognition must be discontinued. The Council is charged under the Act with ascertaining, not the sufficiency of Indian qualifications for the needs of practice in India, but their sufficiency as conferring a registrable title to practise all three branches of the profession in this and other non-Indian parts of the Empire.

Work of Special Committees.

The Pharmacopœia Committee has had under consideration the Draft Regulations proposed by the Home Office for giving effect to the recent Dangerous Drugs Act. The Committee pointed out to the authorities various particulars, suggested by its members and by other members of the Council, in which amendment of the Draft was necessary in the public interest. The Chairman and Secretary, on behalf of the Committee, have had interviews with the officials concerned, and have by request given information on the subject to a special committee set up by the Home Secretary for the purpose of considering the numerous amendments to the Draft Regulations that had been proposed by medical and pharmaceutical bodies. It is understood that a detailed revision of the original text has been undertaken by the Home Office, with a view to removing, so far as the Act permits, the objections urged against the Draft. We have not yet received copies of the Regulations as amended, but we understand that effect will be given to our representations.

The Departmental Committee, appointed by the Ministry of Health to consider and advise upon the administrative measures to be taken for the control of the quality of certain therapeutic substances, such as serums, vaccines, salvarsan, &c., which cannot be tested by direct chemical means, has issued its Report. The recommendations give effect, in what appears to be a satisfactory manner, to the wishes of the Council, as expressed in a communication made to the Lord President in 1909. They will be considered in detail by the Pharmacopœia Committee, and reported on by the Council at this Session.

The Dental Committee also has been active during the recess in considering and advising on the successive drafts of the Dentists Bill, during the course of its preparation by the Ministry of Health. As it was made abundantly clear that the Bill would have little prospect of passing into law unless its provisions were generally agreed to beforehand by the various bodies concerned, a number of conferences have taken place at which the views of the Council, and those of representative members of the dental profession, were discussed with the officers of the Ministry. The Bill is now before Parliament, and has been read a second time in the House of Commons. While it embodies many of the points on which the Council has from time to time laid stress, it contains one or two that have not yet been considered by the Dental Committee or endorsed by the Council. On these it is possible that the Council may have further instructions to give to its representatives. But the Bill makes so great a step towards the removal of the dangerous abuses revealed by the Departmental Committee's Report that, though we may regret its imperfections, we may be prepared to welcome it as an earnest of wider reforms. I may mention that, at the instance of the Lord President, a clause has been introduced to give effect to your resolution of Nov. 27th, 1917, whereby three additional members of the Council, who are registered graduates or licentiates in dental surgery, and members of the new Dental Board, are to coöperate with the Council when dealing with dental matters. The additional or dental members are to be appointed by the Privy Council.

Finance and Registration.

Sir Donald MacAlister, after regretting that no progress had been made in Parliament with the Bill for simplifying, with a view to economy, the procedure at the election of Direct Representatives, briefly reviewed the finances of the Council for the year 1920. These he showed to be satisfactory. There is an aggregate surplus of income over expenditure and the expenses of the regular inspections have been met out of reserve. A general increase in receipts for registration accounts for this position. He continued:—

The registration of medical students, which in 1919 rose to 3420, in 1920 fell to the more manageable number of 2531; but this number is still higher than in any year prior to 1919. In my opinion, it would be in the interest of sound professional education were the numbers still further reduced. They impose a severer strain, educational and financial, on the schools and hospitals than the necessary recruitment of the profession demands, and in present circumstances the teaching institutions are less able to meet the strain. To raise the educational standard for admission, and to increase the fees for professional tuition, would thus seem, from all points of view, to be prudent and justifiable.

In respect of dentistry, a profession which still needs a large accession of fully trained recruits, the registrations in the Dentists Register number 217, as compared with 128 in the year before. They still fall short of the annual number before the war. New dental students, however, number 560. This, though somewhat less than in 1919, is (except for that year) the highest entry yet recorded. The small addition to the ranks of qualified dentists accounts, no doubt, for the unfavourable position of the Dental Fund. Last year it showed a deficit of £517. Should the Dentists Bill become law a new position will be created, and comparison with the present statistics will no longer be practicable. It is for this reason that I have ventured to bring to your notice the figures relating to what may be the final stage of the régime which has lasted since 1878. The finances of the Dental Board will have other

resources to draw upon and other charges to reckon with under the new conditions.

The Medical Curriculum.

The procedure which you authorised in November for the investigation of the medical curriculum has been duly carried into operation under the direction of the Education Committee. In connexion with each Branch Council, four subcommittees have been set up, including many men of eminence in the sciences bearing on medicine and in its practice. These have readily lent their valuable aid to the Council's inquiry, and our thanks are due to them for their helpful coöperation. A number of preliminary reports and memoranda on different branches of the subject have been prepared and circulated to members. Before long joint meetings and conferences will be arranged for the coördination of these proposals, with a view to the elaboration of considered conclusions and recommendations, for presentation to the Education Committee and ultimately to the Council.

The President said that the reports of the inspectors and visitors of the qualifying examination in the United Kingdom were practically ready for consideration by the Examination Committee, and he took the opportunity of acknowledging gratefully, for the Council and himself, the valuable services which had been rendered. In this expression he particularly included the name of Dr. Bruce Low, who has inspected the Public Health examinations. This task is complete and some of the results of the inspection will be available at once for the revision of the curriculum. Sir Donald MacAlister closed his address with the welcome information that the disciplinary cases would be few and simple.

Obituary.

SIR ROBERT WILLIAM JACKSON, L.R.C.P., F.R.C.S. IREL., C.B.,

DEPUTY SURGEON-GENERAL (RETD.).

Deputy Surgeon-General Sir Robert William Jackson, whose death at the advanced age of 94 was briefly announced in our Service columns last week, was probably the oldest medical man in Ireland. He was born in 1826 and qualified for the medical profession in 1851 with the licentiateship of the Royal College of Surgeons in Ireland, and three years later obtained his first commission in the Army. In the Crimea, whither he was immediately sent, he served throughout the whole of the campaign, and was present at the siege and fall of Sevastopol, obtaining the medal with clasp and the Turkish medal. Later he went to India during the Mutiny, where he assisted at the relief of Lucknow and was present at the battle of Cawnpore. In the operations during the Ashanti War, 1873–74, he served with distinction and took part in the capture of Coomassie. For his services he was mentioned in dispatches, received the medal with clasp, and was awarded the C.B. He was also mentioned in dispatches during the South African War of 1879, and in 1882, soon after reaching the rank of Brigade Surgeon, he joined the Egyptian Expedition and was present at the battle of Tel-el-Kebir. He was again mentioned in dispatches, received the medal with clasp, the bronze star, and the third class of the Medjidie. He was knighted on retirement after nearly thirty years of active service with the rank of Deputy Surgeon-General.

After his retirement Surgeon-General Sir Robert Jackson took up his residence in his native country and occupied himself with religious, social, and municipal activities. He was a warm supporter of the Young Men's Christian Association, and a promoter of all efforts in behalf of the poor and suffering. Sir Robert Jackson was twice married and of his four children, three sons and one daughter, a son was drowned some twenty years ago through the foundering of a ship on which he was serving as surgeon. Notwithstanding his age, Sir Robert Jackson was in full possession of his faculties when he died, and he will be greatly missed by his many friends and colleagues who were attracted by his modest and charming personality.

Correspondence.

"Audi alteram partem."

THE ÆTIOLOGY OF PSEUDO-COXALGIA.

To the Editor of THE LANCET.

SIR,—In his letter in THE LANCET of Feb. 19th Sir Henry J. Gauvain says: "Sundt and Legg both consider that trauma is the cause and that the condition is not due to infection." This, as far as I am concerned, is a misunderstanding. In my work entitled "Undersoekelser over Malum Coxæ Calvè-Legg-Perthes,"[1] I have insisted that the cause of this disease is not one but several. First among the causal factors comes *trauma*. In 40 of my 75 cases—i.e., in 53·3 per cent.—there was a history of trauma, in most cases acting directly on the hip, a shorter or longer time before the appearance of the first symptoms. Frequently these appeared immediately after the trauma.

Next to trauma *infection*, principally the so-called *rheumatic* infection, apparently plays a part. Cases of mal. c. C.-L.-P. have been recorded, in which the disease has developed directly or some time after acute polyarthritis (Brandes, Taylor and Frieder, Flemming-Moeller, Elmslie), five cases in all, to which may be added my two Cases (11 and 27). In my first case, as in Elmslie's, there was chorea minor, as well as acute polyarthritis. In another case of mine (case 32) "tic convulsif" appeared when the patient grew up. In other and rarer cases a C.-L.-P. apparently can at once or later follow acute osteomyelitis of the hip. Such a case was described by Perthes,[2] and probably one described by Preiser,[3] which appeared as a result of an acute "Säuglingsarthritis" of the hip. Some cases may result from a chronic infection with weakened virus, as Borchard and Eden suppose in the case of arthritis deformans.

Syphilis.—In nine recorded cases Wassermann's reaction was carried out and was always negative. The same was the case with 30 of my patients. The only exception was a patient (Case 22) who, however, never presented any symptom of syphilis. Wassermann's reaction was negative in the mother.

Tuberculosis.—All writers seem now to agree that the disease has nothing to do with tuberculosis. In 59 of my cases, in whom v. Pirquet's reaction was carried out, it has been positive in 18 cases, negative in 41—i.e., v. Pirquet's reaction was negative in 69·5 per cent. of my cases.

Of particular interest is the case of a girl, 9 years old, who developed slight diphtheria and was injected with serum on the outside of the left hip. Fourteen days afterwards she developed a serum-exanthem, with fever, delirium, swelling, and excessive sensitiveness in the various joints, especially those of the left leg. The fever continued for three days; the swelling of the joints did not vanish till eight days afterwards. When she got about again she could not move or lift her left leg on account of pain in the hip, in which typical mal. c. C.-L.-P. developed.

Rickets.—Calvè [4] decidedly associated pseudo-coxalgia with rickets. This view is also shared by Guye and Soederlund, whilst Perthes mentions that rickets in none of his cases could be considered the cause of the disease. Among 94 published cases, including my own, there was a history of rickets only in 32 cases—i.e., in 34 per cent. Among 120 scrofulo-tuberculous children at the Coast Hospital at Fredriksvern I found one or more signs of latent rickets in 36·7 per cent. If rickets was a frequent cause of mal. c. C.-L.-P. one would expect to find it coupled with the typical form of the rachitic coxa vara. This is, however, not the fact. In my material there is only one such case (Case 65), a girl,

[1] Disquisitions on Malum Coxæ C.-L.-P., Christiania, 1920 (Jacob Dybwad).
[2] Deutsche Zeitschr. f. Chir., Bd. cvii.
[3] Zeitschr. f. orth. Chir. Bd. xxi.
[4] Revue de Chirurgie, 1910.

who in infancy had been medically treated for rickets. When she was 8½ years old there was a coxa vara on both sides, combined on the left side with mal. c. C.-L.-P. The patient had never limped nor shown any symptoms till after a trauma one year earlier. Immediately afterwards she had begun limping and complaining of pain in the left knee.

Mal. c. C.-L.-P. can appear in a previously completely normal joint, as Sinding-Larsen, among others, has maintained,[5] and as one may also find examples of in my casuistic.

Frommé's hypothesis that "Spätrachit" is the cause of the disease is not generally applicable. This does not, however, exclude the disease being in some cases an expression of "tardive rachit." This, I think, to be the case with two patients of mine, described in my work (Cases 22 and 66), as well as with two later cases. All these four patients were boys whose disease had attacked both sides. All had suffered from rickets which had put its stamp on their entire habitus.

I suppose the chances are that in all four cases the cause of the disease was founded on a rachitic basis. This I think to be the case with three other bilateral cases examined by me (Cases 18, 47, 54). Taken all in all, I suppose that bilateral disease developing either spontaneously or after a trauma in patients with a history of rickets is to be considered as determined by rickets, and when the disease does not appear till four years afterwards, it is to be considered as a "tardive rachit."

Calot has lately, on a basis of 150 observations,[6] denied the existence of any mal. c. C.-L.-P. in saying categorically, "La maladie de Perthes (ou Legg) n'existe pas. Les containes des cases cités sont autant de subluxation congenitales larvées et meconnuées." The very fact that the disease as mentioned mostly appears in a previously quite normal hip disproves sufficiently Calot's theory. The subluxation which is not rare in the course of the disease is secondary, unless it depends on alterations of the acetabulum of a rachitic nature.

Lenormant, in 1913,[7] and later Delitala,[8] maintained that the disease depends upon a dystrophia cong. The same can be said against this as against Calot's theory, but on the other side his hypothesis cannot be rejected when the symptoms of the disease have been present ever since the child began walking. Such a case is No. 57 in my material.

Though there are thus several causes of the disease all have this in common, that they bring forth a disturbance in the joint's state of nutrition. As in nearly all cases the clinical and X ray picture is the same and the course of the disease is uniform, it is likely that the causal factors mentioned are only accidental and exciting, and the actual predisposing cause is to be sought in more fundamental circumstances. Note the development of the disease at a particular age, its predilection for one sex, its at times familiar appearance, and its alternation within the same family with other diseases of the hip (one can find mal. c. C.-L.-P. on one side and luxat. c. cong. on the other in the same individual). I have thought the most fundamental cause of the disease to be disturbances of certain endocrine glands or of the interaction between them. One must in this connexion remember the relation of osteomalacia to the ovaries, particular forms of arthritis deformans to the thyroid gland, and Axhausen's interpretation of these and other diseases as "Knochendystrophie" brought about by alterations in the secretion of the intern glands. Læven, in examining a skeleton of a cretin, found a pronounced mal c. C.-L.-P. on both sides,[9] and Erkes has found the disease in a patient with a pronounced *typus adiposo-genitalis*.—I am, Sir, yours faithfully,

HALFDAN SUNDT,
Medical Superintendent of Fredriksvern Coast Hospital, Norway.

Fredriksvern, Norway.

[5] Norsk Magazin for Lægevidenskapen, No. 4, 1915.
[6] Journal des Praticiens, Jan. 22nd, 1921.
[7] La Presse Médicale.
[8] American Jour. of Orthop. Surg, 1915.
[9] Deut. Zeitschr. f. Chir., Bd. ci.

WARMING ETHER VAPOUR FOR INHALATION.

To the Editor of THE LANCET.

SIR,—May I draw attention to what I consider a danger with regard to some intratracheal anæsthesia apparatus recently described in your columns[1]—viz., the method of heating the ether-laden air by an electric incandescent lamp? Dr. W. J. McCardie has described[2] an accident caused, almost certainly, by a minute spark in the bulb fittings which fired the ether, and it seems not to have been a unique occurrence. The temperature required for the ignition of ether is considerably higher than for coal-gas, but, once alight, the vapour burns fiercely, the flame licking up outlying streams. Mixed with a proper proportion of air it may explode with violence. Moreover, heating gases and vapours with the object of administering them warm is generally futile. Their specific heat is so extremely low that, while they can be heated with the utmost ease, passage through a foot or two of rubber tubing, even with moderate rapidity, will effectually reduce them to its own temperature, nor does the temperature of the tube become appreciably raised. For example, the temperature of air blown by a foot-bellows through 20 feet of copper tubing in hot water, appeared to be 110° F., while, blown only through a few fittings, equal to about 8 or 10 inches of the hot tubing, it was 108° F., and many experiments gave consistent results. Again, where the temperature of a room was 62° F. ether-laden air blown through a tube immersed in water at 152° F., which heated it efficiently, and then through 18 inches of rubber tubing about 9/32 inch in diameter for five minutes, registered 68° F., while five minutes after the hot water had been removed it registered 65° F.; showing, it would seem, that the temperature of the room largely controlled the result. There are fallacies in connexion with taking the temperature of gases in movement. They invalidate the reading of a thermometer placed in the space underneath a lint-covered Schimmelbusch frame, where it will act much as the wet bulb in a hygrometer.

Possibly a useful way of warming vapour for inhalation would be to pass it through a short length of rubber tubing—18 inches would suffice—placed on the patient's chest, beneath the clothing, and thence by the shortest route to his nose and mouth.—I am, Sir, yours faithfully,

K. B. PINSON,
Anæsthetist, Manchester Royal Infirmary.

May 16th.

EARLY DIAGNOSIS IN DIPHTHERIA.

To the Editor of THE LANCET.

SIR,—If in all cases of diphtheria antidiphtheritic serum could be administered sufficiently early, and in efficient dose, then the disease could be regarded as comparatively innocuous. This, I believe, is the steadily growing and considered opinion of those in the profession in a favourable position to judge. And now if this statement of opinion is granted as correct, then the continued considerable death-rate in this disease is a reproach. Ideally, serum ought to be administered at once on the first reasonable suspicion of diphtheria, then a swab should be taken from the throat. If the result of bacteriological examination of the latter is positive then valuable time in treatment has been gained, and if negative, the patient's condition has not been prejudiced. Too often it is found when the case arrives at the isolation hospital that serum has not been administered at all, or that valuable time in treatment has been lost by waiting on the result of bacteriological examination before administering serum. The important point to be noted here is that during this lost time *toxins* are rapidly becoming *fixed* in the patient's nervous tissue, with irreparable

[1] THE LANCET, April 2nd, p. 704, and April 30th, p. 918.
[2] Royal Soc. of Medicine, Section of Anæsthetics, Mar. 4th, 1921

damage to the prospects of subsequent treatment and consequently also to prognosis.

The following practical steps to give the all-important earlier administration of serum suggest themselves to me:—

(1) Health visitors, under the M.O.H., should be instructed how to take swabs and administer serum.

(2) The practitioner in attendance should send, by telephone or otherwise, immediate notice to the Health Office of cases of sore throat, in which there exists a reasonable suspicion of the existence of diphtheritic infection, with a request that the health visitor be sent at once to administer an initial dose of serum in such quantity as the practitioner may order.

(3) A swab could be taken by the health visitor at the same time, and the result of bacteriological examination awaited.

(4) Free access to fresh serum and swab outfit should be given to the practitioner at all times to provide for the following contingencies: (*a*) the practitioner wishing to administer the initial dose personally, or (*b*) to allow of the practitioner giving it personally, where unnecessary delay would otherwise arise through the health offices being closed, as at night-time, week-ends, or public holidays.

It should, however, be noted that, not infrequently (and this especially applies to working-class areas), the delay in the application of serum treatment has arisen through parents not considering it necessary to seek early medical advice in cases of sore throat in their children, and this is especially dangerous in the presence in the district of diphtheria in epidemic form. Parents, and the public generally, might be made more alive to the sovereign virtue of serum administered early in diphtheria, and to the serious consequences to the patient that may arise through omission of such early administration. This could be done by educative propaganda, say by the public health authorities.

If this letter helps in any way the efforts to reduce a preventable mortality it will have accomplished its purpose.—I am, Sir, yours faithfully,

J. EWING ADAM, M.D., F.R.C.S. Edin., D.P.H.,
Medical Superintendent, Mogden Isolation
May 23rd, 1921. Hospital, Isleworth.

To the Editor of THE LANCET.

SIR,—The letter from Dr. Frederic Thomson in THE LANCET of May 21st indicates the responsibilities of directors of bacteriological laboratories.

When I had charge of the bacteriological laboratory in the borough of Southend-on-Sea, in reporting on swabs submitted I was in the habit of issuing a printed report of the result of examination, at the foot of which I warned the practitioner that a negative result did not necessarily mean that the case was not one of diphtheria. Another sentence emphasised the importance of giving antitoxin when diphtheria was suspected, without waiting for the bacteriological result.

The Norfolk County Council has recently started a County Laboratory, and naturally I am adopting the same precautions in my reports.

I am, Sir, yours faithfully,

J. T. C. NASH.

The Shire House, Norwich, May 23rd, 1921.

THE WEANLING.

To the Editor of THE LANCET.

SIR,—The babies of the poor country Arabs in Upper Egypt have no intermediate stage. They receive a slab of coarse wholemeal bread while they are still on the breast, and when weaned many of them get little or no milk because of their parents' poverty. These children, fed chiefly on the real staff of life—water, raw fruits, and raw vegetables—also with lentil soup, grow into fine men and women with good teeth and powerful jaws. In fourteen years no case of appendicitis, no case of gastric ulcer, no case of cancer either of breast or stomach was seen at the hospital. Yet the Egyptian surgeons inform me that they see a fair number of cases of appendicitis amongst the children of the rich in Cairo. The country native if promoted to be the servant of a house in Cairo loses his good teeth, though I think that the large amount of raw fruit he still eats tends to prevent their decay. The poor native takes his sugar only in the form of the fibrous cane or in other fruits. What I should like to know, Sir, is this: How many cases of appendicitis, gastric or duodenal ulcer, and cancer of the stomach arise in those favoured few of our population who have never suffered from dental caries? Surely the first thing is to concentrate on the prevention of dental caries; at any rate it is my firm belief that with the return of sound teeth the diseases above-mentioned will almost disappear.

I am, Sir, yours faithfully,

W. E. NICKOLLS DUNN.

Bath Club, Dover-street, W., May 13th, 1921.

HELIOTHERAPY IN SURGICAL TUBERCULOSIS.

To the Editor of THE LANCET.

SIR,—It is no exaggeration to state that heliotherapy is to-day, at least on the Continent, recognised as the treatment par excellence of surgical tuberculosis. The success of Rollier at Leysin and others on the Riviera testifies that the medical profession and the public at large are becoming more and more aware of the great value of a systematised sun cure. Thus no one need nowadays despair of ever bringing back to perfect health, and at times with absolute restoration to its primitive function, a chronically inflamed tuberculous joint. That eminently desperate condition, morbus coxæ, even if suppurating, and that no less discouraging affection, Pott's disease, when not too advanced, both yield to the all-powerful and healing effect of the sun. Again, chronic adenitis, whether the glands be enlarged singly or in groups, whether suppurating or not, can be and is always cured by heliotherapy.

As Rollier says, few cases of local tuberculosis are more susceptible to the treatment, and this without resorting to aspiratory methods, injection of antiseptic substances, and still less to excision. Thus a cure is obtained without reinfection, so constant after operative treatment, and without scars. On the Riviera, where we have treated a large number of cases by sun cure, we have further obtained excellent results in tuberculosis of the abdomen, in all manners of chronically inflamed conditions of bony surfaces, tuberculous or otherwise, in tuberculosis of the uro-genital tract, pleuro-pneumonia, neuritis, neuro-arthropathies, callous ulcers with varicose enlargement, staphylococcic infections, and in the convalescence from abdominal operations, especially those connected with the bowels. To sum up, heliotherapeutics not only shows itself particularly efficacious in all forms of local tuberculosis, when not too advanced, but is also the ideal form of treatment for a large variety of diseases where a general impairment of health has led to an imperfect action of the kidneys and of the skin, and where symptoms of chronic intoxication by toxins dominate the scene.—I am, Sir, yours faithfully,

G. A. CASALIS DE PURY.

Weymouth-street.

SURGICAL SHOCK.

To the Editor of THE LANCET.

SIR,—In surgical shock, uncomplicated by severe hæmorrhage, either external or internal, or by toxic substances capable of dilating capillaries, there appears to be an intense contraction of the whole vascular system, arteries, veins, and capillaries, as stated by Mr. John D. Malcolm. Granted the existence of a contracted vascular system, this becomes no longer capable of containing all the blood, and the volume of blood is reduced by migration of the blood-fluids from the vessels into the tissues, with the result that the blood in actual

circulation is greatly diminished. Appropriate methods may be expected to demonstrate, if they have not already done so, the presence, in the tissues, of the missing blood-fluids. The foregoing explanation, being strictly in accord with clinical facts, is, in my opinion, far more convincing than is the assumption that the blood must be in some part of the vascular system, and therefore, "the dilatation of arteries and veins having been ruled out, it could only be in the capillaries."

I am, Sir, yours faithfully,

Plymouth, May 21st, 1921 C. HAMILTON WHITEFORD.

PUBLIC HEALTH AND THE COAL DEADLOCK.

To the Editor of THE LANCET.

SIR,—Perhaps the most remarkable thing about the coal deadlock is the good state of the mental public health. Nobody seems to be getting hysterical. We may be heading for destruction, but we seem to be doing so in a philosophical, good-humoured manner. We learned to put up with restrictions during the war, and have gone back to them quite placidly. For the ordinary public there has been no food difficulty as yet. The difficulty about domestic fuel comes at a time of the year when it is not much felt. A hot dinner once, twice, or thrice a week instead of every day is no great deprivation. Butter is cheaper, vegetables plentiful, and up till now there has been no difficulty about the delivery of milk. We can take to a simpler dietary and a simpler life with probable benefit to our health. A little discomfort on necessary railway journeys is nothing to make a fuss about. The curtailing of tram services may do some of us good, and the reduction of gas and electric lighting is more of an inconvenience than a danger to health. The use of baths is curtailed, and with it the cult of swimming. This will be a relief to those ear and nose specialists who regard the public baths as a source of much ill. The Briton is proverbially fond of his "tub," but many millions got used to fewer tubs during the war. Many people who have been used to hot baths find the change to cold ones exhilarating. There is no evidence that the public health has suffered as yet. The air of our industrial towns is cleaner. We are conserving our supply of coal at a time when it cannot be disposed of profitably. Fortunately, the necessary sanitary services, such as the collection and disposal of refuse, are very little dependent on coal. Perhaps the deadlock will even give a fillip to the movement for recovering the millions of tons of available fuel from our dustbins.

Provided the strike funds and relief are wisely administered and spent, there is no reason why the public health should suffer, except in so far as the extension of unemployment brings fresh sections of the population below the poverty line. In London the number of necessitous children requiring meals in elementary schools was in December, 1920, double what it was in December, 1919, and the number has increased week by week ever since. It is not nutrition with which we are specially concerned at the moment. All through the trouble a spirit of cheerful optimism has prevailed. I met a man a week ago who prophesied that in three weeks the coal deadlock, the German trouble, and the Irish trouble would be practically settled. He is only typical of many. If you travel in a railway compartment crowded with reservists just called up the one thing which strikes you is their imperturbable good humour. I deduce from all this that the mental public health is in a sound state. It is not that people "don't care"; it is that they realise that they are up against trouble that has to be seen through, and they are determined to see it through cheerfully and without unnecessary "grousing." I do not want to minimise the seriousness of the situation, but as grumbling does not help its absence is all to the good.—I am, Sir, yours faithfully,

May 21st, 1921. M.O.H.

Medical News.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—As the result of the special and ordinary Primary Fellowship Examination held from May 3rd to 14th, for which 171 candidates presented themselves, 58 candidates were approved and 113 were rejected. The following are the names and medical schools of the successful candidates:—

L. H. Appleby, Kingston and London; D. C. G. Ballingall, Cambridge and St. Bart.'s; F. G. Beatty, Trin. Coll., Dublin; A. Blackstock, King's Coll.; C. E. Bond, Cambridge and Univ. Coll.; G. A. Brookes, Sydney and London; H. A. Brookes, Edinburgh; G. G. Bruce, Aberdeen; J. T. Burrell, Cambridge and London; G. M. Cameron, Toronto and St. Mary's; C. H. Carlton, Oxford and St. Mary's; S. M. Cohen, Cardiff and St. Bart.'s; J. R. M. Collie, Dalhousie and St. Mary's; R. S. Corbett, Cambridge and St. Bart.'s.; R. C. Davenport, St. Bart.'s; C. O. Davies, Liverpool; S. N. Deboo, Bombay and Guy's; M. R. Flynn, Sydney and Middlesex; G. N. Golden, London; L. B. Goldschmidt, King's Coll.; W. D. Hart, Otago and St. Mary's; G. T. Henderson, Cambridge and Guy's; C. A. Horder, St. Bart.'s; L. G. Housden, Guy's; M. V. Hurley, Cork and London; S. P. Jacobson, Cape Town and Guy's; J. Jemson, Guy's; A. R. Jones, Cardiff and Middlesex; N. A. Jory and N. E. Laurence, St. Bart.'s; M. A. Lautré, St. Thomas's; K. W. Leon, St. Bart.'s; A. R. Lister, Cambridge and London; C. A. Lupton, Cambridge; Gladys Helen Marchant, Calcutta and Lond. Sch. Medicine for Women; J. Maxwell, St. Bart.'s; Ruth E. Millar and W. Miller, Edinburgh; L. Morris, Manchester and Middlesex; T. D. Overend, Oxford and Middlesex; J. A. Panton, Manchester; C. M. Pearce, St. Bart.'s; N. A. M. Petersen London; J. E. Purves, Edinburgh and St. Mary's; B. T. Rose, Birmingham; J. P. Ross, St. Bart.'s; Violet Ione Russell, Lond. Sch. Med. for Women; J. R. Smith, Cambridge; M. J. Smyth, Dublin and Middlesex; W. O. Stevenson, Toronto and Univ. Coll.; Hilda North Stoessiger, Lond. Sch. Med. for Women; G. C. Swanson, Glasgow and Univ. Coll.; D. B. Walker, Otago and Royal Free; A. D. Wall, St. Bart.'s; E. C. Warner, Guy's; F. W. Watkyn-Thomas, Cambridge and St. Bart.'s; H. B. White, St. Bart.'s; and S. H. Woods, Trin. Coll., Dublin.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH, ROYAL COLLEGE OF SURGEONS OF EDINBURGH, AND ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—The following candidates having passed the requisite examinations have been admitted Diplomates in Public Health:—

Robert B. Watson, Robert B. Stewart, Cecil C. Brown John S. Elliot, John B. Primmer, Donald A. Cadman, Andrew I. Meek, Jamit Singh, John C. Simpson, Norman S. R. Lorraine, Colin Milne, George G. S. Johnston, David T. Macleod Large, George P. Taylor, and Jane Elizabeth Hay.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—At a meeting of the College held on May 18th the following candidates, having passed the requisite examinations, were admitted Fellows:—

John P. Blockley, John W. Burns, Arthur G. Clark, William A. Cochrane, Thomas Colley, Cyril C. H. Cuff, Charles W. Graham, John M. Hyde, Victor J. F. Lack, Thomas Lindsay, Helen Meldrum McMillan, Walter Mercer, Mabel Lida Ramsay, George C. Scantlebury, Stuart Scoular, George H. Stevenson, and Stanley G. Whitfeld.

The following candidates, having passed the requisite examinations, received the Higher Dental Diploma: Grantley Smith and James A. S. Wright.

At the same meeting the Bathgate memorial prize, consisting of bronze medal and set of books, was, after a competitive examination in Materia Medica, awarded to James Maitland McLintock, and the Ivison Macadam memorial prize in Chemistry, consisting of bronze medal and set of books, was awarded, after competitive examination, to John Harkness.

HARVEIAN SOCIETY.—The annual dinner will be held on Wednesday, June 22nd, at 7.30 P.M., at the Café Royal, Regent-street, London, W.

ROYAL INSTITUTION OF GREAT BRITAIN.—The Friday evening discourse on June 3rd, at 9 P.M., will be delivered by Mr. Leonard Huxley, editor of the *Cornhill Magazine*, on Chronicles of the Cornhill.

GREAT NORTHERN CENTRAL HOSPITAL.—A bazaar in aid of this hospital will be held at Crewe House on June 2nd and 3rd.

THE PEOPLE'S LEAGUE OF HEALTH.—Lady Curzon held an At Home at 1, Carlton House-terrace, on May 24th, to inaugurate her office of Appeal Director of the People's League of Health. The speakers included Viscount Burnham, the Bishop of Birmingham, Sir Bruce Bruce-Porter, and Sir Johnston Forbes-Robertson.

UNIVERSITY OF LONDON.—*Hygiene.*—A course of four advanced lectures on Recent Developments in Legislation for the Prevention of Disease will be given by Dr. Charles Porter at University College, Gower-street, London, W.C., at 5.30 P.M. on May 30th and June 3rd, 6th, and 10th.

Pharmacology.—A course of four advanced lectures on Some Actions of Foodstuffs in the Production and Treatment of Disease will be given by Prof. Edward Mellanby at the Royal College of Surgeons, Lincoln's Inn-fields, London, W.C., at 5 P.M. on June 6th, 7th, 13th, and 14th.

Embryology.—A course of three advanced lectures on Recent Advances in Experimental Embryology will be given by Prof. E. W. MacBride, F.R.S., at the Royal College of Science, Exhibition-road, London, S.W., at 5 P.M. on June 7th, 8th, and 9th.

Medicine.—An advanced lecture on Permeability in Physiology and Pathology will be given at the Royal Society of Medicine, 1, Wimpole-street, London, W., by Dr. H. J. Hamburger, at 5 P.M. on June 8th. This lecture, which will be delivered in English, is the last of a series of six arranged under the scheme for the exchange of lectures in medicine between England and Holland.

A course of four advanced lectures on the Therapeutic Use of Digitalis will be given by Prof. F. R. Fraser, in the Surgical Lecture Theatre, St. Bartholomew's Hospital Medical School, West Smithfield, London, E.C., at 5 P.M., on June 13th, 15th, 17th, and 20th.

All these lectures are addressed to advanced students of the University and to others interested in the subject Admission is free, without ticket.

MEDICO-PSYCHOLOGICAL ASSOCIATION OF GREAT BRITAIN AND IRELAND.—At the quarterly meeting of this Association on June 7th, Sir Frederick Mott will deliver the second Maudsley lecture, at 4.30 P.M., at the Maudsley Hospital, Denmark Hill, London, S.E.

ROYAL SOCIETY OF ARTS.—On Monday, May 30th, at 8 P.M., Sir Kenneth Goadby will read a paper on Industrial Disease and Immunity at the house of the Society, John-street, Adelphi, London, W.C. The Rt. Hon. John R. Clynes, M.P., will preside, and the paper will be followed by a discussion.

RONTGEN SOCIETY.—An exhibition of Radiographs will be held by the Rontgen Society in the Royal Photographic Society's rooms, 35, Russell-square, London, W.C., during the month of June. The exhibition will be open daily, Sundays excepted, from 10 A.M. to 5 P.M., and all who are interested are invited to attend.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.—At a meeting of this society held on May 20th Dr. W. J. Howarth, medical officer of health for the City of London, was elected president of the society for the session 1921–22. Dr. Howarth will take office in October next. At the same meeting the honorary fellowship of the society was conferred on Dr. Alfred Hill, formerly medical officer of health for the City of Birmingham, "for long and distinguished services to preventive medicine and public health administration." Dr. Hill, who has just entered his 96th year, was president of the society in 1886 and 1887.

MEDICINE IN THE SOUTHERN PARLIAMENT OF IRELAND.—A large number of medical men have been returned unopposed to the Southern Parliament. The following names occur: Sir James Craig, Dublin University; Mr. R. F. Hayes, East Limerick and City of Limerick; Mr. V. J. White, Waterford and East Tipperary; Mr. P. McCartan, King's and Queen's Counties; Dr. J. Ryan, Wexford; Dr. Cusack, Galway; Mr. J. Crowley, Mayo; Dr. Ferran, Sligo; Dr. J. P. McGinley, Donegal; Dr. Ada English, National University. Of these members five are in jail, three of them without any charge being preferred against them.

THE LATE MR. W. H. ELLIS.—William Henry Ellis, M.R.C.S., L.S.A., who died at Bradford on May 8th, was consulting surgeon to Sir Titus Salt's Hospital, Shipley, and well known as a medical practitioner in the West Riding. He received his medical education at Cambridge and at St. Bartholomew's Hospital and qualified in 1866. For a time he held a house appointment at the Great Northern Hospital, London, and afterwards started practice at Shipley, for which town he became M.O.H., and was later appointed certifying surgeon under the Factory and Workshop Acts, and a medical referee. He retired from practice in 1910, when he was placed on the commission of the peace for the Riding. Mr. Ellis was the chairman of the Salt Trust Board of Governors, a member of the Shipley School Board, and, in the early days of the Volunteer movement, held a commission in the Volunteer Force. The part which Mr. Ellis took in the public life of the community among which he practised will make his loss keenly felt by many.

HOSPITAL FOR SICK CHILDREN, GREAT ORMOND-STREET.—A course of lectures, free to medical practitioners, is being held at this hospital on Thursdays at 4 P.M. The next lecture will be delivered on June 2nd by Dr. G. Still on Some Urinary Disorders. Subsequent lectures will be announced in our Medical Diary. Clinical instruction is also given by the members of the staff at their visits. The fee to post-graduates for three months' attendance is £5 5s., and for perpetual attendance, £10 10s. Clinical clerkships and dresserships are open to students—fee, £1 1s. per month.

DALRYMPLE HOUSE, RICKMANSWORTH.—We have received the thirty-seventh annual report of this institution, which is under the management of the Homes for Inebriates Association. During the year 56 persons have been admitted as private patients and 23 under the Inebriates Act; these figures do not include readmissions. The fact that culture and education do not protect a man from over-indulgence is seen clearly by the list of occupations of those who since the opening of the home have been driven to seek its help, for professors, librarians, solicitors, architects, &c., are all included. Even those whose business it is to preach against indulgence themselves sometimes fall, as 31 clerks in holy orders have been admitted; and a scientific knowledge as to the danger of taking alcohol is not a complete safeguard, for 116 medical practitioners have sought relief. The medical superintendent, Dr. F. S. D. Hogg, reports that he uses a variety of methods in the treatment of his patients, and is able to give a large measure of freedom to almost all of them after two to four weeks' residence; the most important aid to recovery he finds to lie in the strengthening of the patient's will-power and determination, and a realisation that total abstinence from alcohol (or from the drug to which he has been addicted) is an absolute necessity.

THE LATE DR. J. M. ROGERS-TILLSTONE.—John Monkhouse Rogers-Tillstone, L.R.C.P. Lond., M.R.C.S., who died at Surbiton on May 16th, at the age of 52, came of a family long associated with Brighton. He studied medicine at St. Bart.'s and qualified L.R.C.P., M.R.C.S., in 1891, practising at East Malling in Kent and later at Chalford in Gloucestershire. Dr. Rogers-Tillstone, after retiring from practice, spent some years at Maidstone. Always interested in the Volunteer movement, he took an important part in the formation of the 1st H.C. Field Ambulance, eventually commanding the unit, and went out to France in December, 1914. He went through the first battle of Ypres, and was mentioned in dispatches for the initiative he showed in evacuating a hospital installed in a ruined building in the town shortly before it was destroyed by fire. Afterwards, a shell burst in front of him and he was thrown from his horse and badly injured. Subsequently he held appointments at Canterbury, Margate, and Colchester. In 1919 he attained the rank of colonel and was transferred from the R.A.M.C. to the Army Medical Service. In 1920, Dr. Rogers-Tillstone became chief of the Home Counties Pensions Board at Guildford, and was holding the appointment at the time of his death.

DEATH OF DR MARTIN DEMPSEY, F.R.C.P.I.—Dr. Martin Dempsey, senior physician to the Mater Misericordiæ Hospital, Dublin, and professor of materia medica in University College, Dublin, died on May 19th. He had been in failing health for some time, and contracting pneumonia he succumbed. He was a little over 50 years of age. Dr. Dempsey, after a distinguished course in the Royal University, took his medical degrees in 1890, and his M.D. degree with gold medal in 1893. He had the reputation of being a sound and wise physician, and a clear and attractive teacher. For many years he enjoyed a large practice as a consultant. Personally he was a man of much charm and wide culture, devoid of show or pretence and much esteemed by his friends.

THE LATE DR. J. S. FERRIS.—Dr. John Spencer Ferris died at Ealing on May 17th at the age of 79 years. After studying at King's College Hospital, London, and in Paris and Germany, he qualified M.R.C.S. Eng., in 1863, taking honours at the M.B.Lond. three years later. He commenced practice in Uxbridge in partnership with the late Dr. Macnamara, and lived there until his retirement in 1910. At first he visited his patients on horseback, but later adopted a high gig with red wheels, his partner's equipage having yellow wheels. He became medical officer and hon. colonel to the Uxbridge Yeomanry, and it is recorded that there was some difficulty in obtaining a horse big enough for him. He was a great friend of Linley Sambourne, who lived near him, and afforded the cartoonist material for some of his inimitable sketches of the yeomanry. At one time Dr. Ferris was an active member of the Uxbridge urban district council, easily heading the poll at the election. Dr. Ferris, who was buried at Great Malvern, is survived by one son, who is in the Navy, and a daughter, his wife having predeceased him.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surgeon Lieutenant-Commanders to be Surgeon Commanders: H. F. Briggs, A. G. Malcolm, H. C. Devas, and H. Burns.

Surg.-Lieut. G. W. Woodhouse to be Surgeon Lieutenant-Commander.

A. C. Esmonde to be Surgeon Lieutenant.

ARMY MEDICAL SERVICE.

Lieut.-Col. R. J. W. Mawhinny, from R.A.M.C., to be Colonel.

ROYAL ARMY MEDICAL CORPS.

Temp. Capt. (acting Major) H. G. Hobson to be Captain.

Lieut. (Temp. Capt.) T. B. H. Tabuteau to be Captain.

Temporary Captains relinquishing their commissions: Acting Major C. C. Chance (granted the rank of Major), and H. Stanger (retains the rank of Captain).

TERRITORIAL FORCE.

Capt. F. J. Morris to be Captain.

Capt. H. B. Logan (late 1st South Middlesex Brigade, R.F.A.) to be Lieutenant, and relinquishes the rank of Captain.

Lieut. R. Price (late R.A.M.C.) to be Lieutenant.

DEFENCE FORCE.

The following temporary appointments have been made:—

Assistant Directors of Medical Services: Temp. Cols. F. W. Higgs (D.F.) and J. G. Martin (D.F.).

Deputy Assistant Directors of Medical Services: Capts. O. Teichman (D.F) and S. S. Greaves (D.F.).

To be temporary Colonels: F. W. Higgs and J. G. Martin.

To be temporary Major: C. V. Bulstrode.

To be temporary Captains: H. Drummond, O. Teichman, and J. D. G. Stewart.

1st East Lancs Field Ambulance (D.F.)—To be temporary Lieutenant-Colonel: T. B. Wolstenholme.

To be temporary Captains: J. F. O'Grady and T. Hamilton.

1st Highland Field Ambulance (D.F.)—To be temporary Lieutenant-Colonel: A. S. K. Anderson. To be temporary Lieutenants: I. S. Thomson, J. I. Moir, G. Burnett, and D. R. Macdonald.

3rd Highland Field Ambulance (D.F.)—To be temporary Captains: D. Roger and W. E. A. Buchanan.

3rd Lowland Field Ambulance (D.F.)—To be temporary Lieutenant-Colonel: F. A. E. Crew. To be temporary Captains: J. A. L. Loudon and C. G. Lambie. To be temporary Lieutenants: O. H. Wild, E. H. Ponder, and R. K. S. Lim.

52nd Lowland Division Sanitary Section (D.F.).—To be temporary Captain: M. Wilson.

1st East Anglian Field Ambulance (D.F.)—To be temporary Major: W. S. Forbes.

1st South Midland Field Ambulance (D.F.).—To be temporary Major: F. G. Hobson. To be temporary Captain: W. D. Gardner.

2nd South Midland Field Ambulance (D.F.).—Temp. Capt. W. W. Newton to be temporary Major. To be temporary Captains: W. W. Newton and Temp. Lieut. N. C. Cooper.

2nd Northumberland Field Ambulance (D.F.).—To be temporary Lieutenant-Colonel: D. L. Fisher.

To be temporary Major: V. Wardle. To be temporary Captains: D. Roberts, F. C. Pridham, and W. McK. Wilson.

49th West Riding Division Sanitary Section (D.F.).—To be temporary Captain: H. L. Robinson.

INDIAN MEDICAL SERVICE.

Lieutenant-Colonel to be Colonel: (Bt.-Col.) R. Heard.

The King has approved the retirement of Lieut.-Col. S. Evans. The King has approved the relinquishment of their commissions by Temp. Capt. Banwari Lal Gupta, Temp. Capt. Shapoor Dinshaw Vania, and Jamshedji Nasarwanji Duggan.

DONATIONS AND BEQUESTS.—The Chelsea Hospital for Women has received £250 from the Trustees of Smith's (Kensington) Charity and £166 1*s.* 7*d.* from the Estate of the late R. I. Campbell.—The British Home and Hospital for Incurables, Crown-lane, Streatham, has received £10 from the Surrey County Football Association.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

Wednesday, June 1st.

SECTION OF SURGERY: at 5.30 P.M.

Papers: Mr. Charles A. Pannett: The Treatment of the Imperfectly Descended Testicle.

Dr. A. Goodman Levy: Cardiac Massage.

Thursday, Friday, and Saturday, June 2nd, 3rd, and 4th.

SECTION OF LARYNGOLOGY: Summer Meeting.

THURSDAY.—Papers, 2.30–6 P.M.

FRIDAY.—Papers, 10 A.M.–1 P.M.
Demonstrations, 2.30–4 P.M.
Clinical Meeting, 4 P.M.
Dinner, 7.30 P.M.

SATURDAY.—Visits to Hospitals.

Friday and Saturday, June 3rd and 4th.

SECTION OF OBSTETRICS AND GYNÆCOLOGY.

The Council desires to call the special attention of Members of the Section to the British Congress of Gynæcology and Obstetrics to be held at the Queen's Hotel, Birmingham, on June 3rd and 4th.

FRIDAY, June 3rd: at 9.30 A.M.

Papers: Dr. W. E. Fothergill and Dr. F. H. Lacey: The Results of Plastic Vaginal Operations for Genital Prolapse.

Dr. A. Donald: The History and Technique of Colporrhaphy.

The following Resolution will be moved by Dr. Fothergill, seconded by Dr. Lacey:—

That in the opinion of the Meeting, operations by the abdominal route are quite unnecessary for the treatment of genital prolapse.

At 2.30 P.M.

Specimens will be shown by—Dr. Clifford White, Dr. Ewan Maclean, Dr. H. Chapple, Dr. G. I. Strachan, and Professor H. Briggs.

Short Communications will be given by—Dr. F. J. Browne, Mr. Gordon Luker, Dr. Walter Swayne.

SATURDAY, June 4th: at 9.30 P.M.

Operations at Birmingham Hospitals.

N.B.—Members desiring further information should apply to Mr. Beckwith Whitehouse, 52, Newhall-street, Birmingham.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 11, Chandos-street, Cavendish-square, W.

FRIDAY, June 3rd.—Adjourned Meeting. Papers:—Lt.-Col. H. Kirkpatrick, I.M.S. (retd.): Some Points on Trachoma. Dr. Carlo Franca: An Early Portuguese Contribution to Tropical Medicine.

ROYAL SOCIETY OF ARTS, John-street, Adelphi, W.C.

MONDAY, May 30th.—8 P.M., Paper:—Sir Kenneth Goadby: Industrial Disease and Immunity.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, May 30th.—12.15 P.M., Dr. Burnford: Pathological Demonstration. 2 P.M., Dr. Simson: Diseases of Women. 2.30 P.M., Mr. Baldwin: Visit to Surgical Wards. 5 P.M., Lecture:—Dr. Arthur Saunders: Gastric Disorders in Children.

TUESDAY.—10 A.M., Mr Steadman: Dental Department. 11 A.M., Dr. McDougal: Electrical Department. 12 noon, Mr. Tyrrell Gray: Demonstration of Fractures. 2 P.M., Dr. Pernet: Skin Department. 2.30 P.M., Mr. Addison: Demonstration of Cases, Surgical Wards. 5 P.M., Mr. Banks Davis: Clinical Lecture:—Throat, Nose, and Ear.

WEDNESDAY.—10 A.M., Mr. MacDonald: Genito-Urinary Department. 12 noon, Mr. Sinclair: Surgical Diseases of the Abdomen. 2 P.M., Dr. Morton: X Ray Department. 2 P.M., Mr. Gibb: Eye Department. 2 P.M., Dr. Owen: Medical Out-Patients.

THURSDAY.—10.30 A.M., Dr. Simson: Gynæcological Demonstration. 12 noon, Dr. Scott Pinchin: Diseases of the Heart. 2 P.M., Mr. Bishop Harman: Eye Department. 2 P.M., Mr. Baldwin: Orthopædic Department. 5 P.M., Special Lecture:—Dr. W. H. Willcox: Toxic Conditions of the Liver (open to all medical practitioners).

FRIDAY.—10 A.M., Dr. Grainger Stewart: Neurological Demonstration. 10 A.M., Mr. Dudley Buxton: Dental Department. 2 P.M., Dr. Burnford: Medical Out-Patients. 2 P.M., Mr. Banks Davis: Diseases of the Throat, Nose, and Ear. 2.30 P.M., Mr. Addison: Demonstration of Surgical Cases, Surgical Wards. 5 P.M., Lecture:—Mr. MacDonald: Retention of Urine.

SATURDAY.—9 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Arthur Saunders: Medical Diseases of Children. 2 P.M., Dr. Sinclair: Surgical Out-Patients.

Daily:—10 A.M. Visit of Post-graduates to Wards. 2 P.M., In-patient, Out-patient Clinics and Operations.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

THURSDAY, June 2nd.—Lecture:—Dr. Still: Some Urinary Disorders.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, Queen-square, W.C. 1.
MEDICAL SCHOOL.

MONDAY, May 30th.—2 P.M., Out-patient Clinic: Dr. Hinds Howell. 3.30 P.M., Lecture:—Dr. Aldren Turner: Psycho-neuroses.

TUESDAY, May 31st.—2 P.M., Out-patient Clinic: Dr. Grainger Stewart. 3.30 P.M., Lecture:—Dr. Risien Russell: Myelitis.

THURSDAY, June 2nd.—2 P.M., Out-patient Clinic: Dr. Farquhar Buzzard. 3.30 P.M., Lecture:—Dr. Kinnier Wilson: Tumours of Spinal Cord (I.).

FRIDAY, June 3rd.—2 P.M., Out-patient Clinic: Dr. Gordon Holmes. 3.30 P.M., Lecture:—Mr. Sargent: Surgical Treatment of Cerebral Compression.

NEUROLOGICAL OPHTHALMOLOGY.

WEDNESDAY, June 1st.—3.30 P.M., Mr. Leslie Paton: Optic Atrophy.

Fee for Post-Graduate Course £7 7s.

C. M. HINDS HOWELL, Dean.

LONDON HOSPITAL MEDICAL COLLEGE (UNIVERSITY OF LONDON), Turner-street, Mile End, E.

Courses of Lectures:—

A Course of Fourteen Lectures on Psycho-Neuroses, to be given by Dr. M. Culpin in the Clinical Theatre of the Hospital. Open to Students of the Hospital and to Members of the Profession.

TUESDAY, May 31st.—5.15 P.M., Lecture IX.:—Symptomatology.

Advanced Lectures in Physiology, to Students of the University and to others interested in the subject.

A Course of Eight Lectures on Reception of Sensory Stimuli, to be given by Prof. H. E. Roaf in the Physiology Theatre.

THURSDAY, June 2nd.—4.30 P.M., Lecture IV.

A Course of Lectures on Child Physiology, to be given by Dr. W. M. Feldman, in the Physiological Theatre.

MONDAY, May 30th.—5 P.M., Lecture.

The Schorstein Memorial Lecture in the Anatomical Theatre of the College.

FRIDAY, June 3rd.—4 P.M., Dr. A. G. Gibson: Chronic Inflammatory Diseases of the Spleen.

ST. BARTHOLOMEW'S HOSPITAL (UNIVERSITY OF LONDON), West Smithfield, E.C.

A Course of Eight Advanced Lectures in Physiology, to be given in the Physiological Laboratory, to Students of the University and others interested in the subject.

TUESDAY, May 31st.—4.30 P.M., Lecture V.:—Prof. J. B. Leathes: Tyrosine.

UNIVERSITY COLLEGE (UNIVERSITY OF LONDON), Gower-street, W.C.

A Course of Four Advanced Lectures in Hygiene to Students of the University and to others interested in the subject.

MONDAY, May 30th, and FRIDAY.—5.30 P.M., Dr. C. Porter: Recent Developments in Legislation for the Prevention of Disease. (Lectures I. and II.)

ROYAL LONDON OPHTHALMIC HOSPITAL (Moorfields) at the Royal Society of Medicine, 1, Wimpole-street, W.

MONDAY, May 30th.—5.30 P.M., Dr. L. Llewellyn: Miners' Nystagmus.

TUESDAY.—Dr. C. G. Symon: Injuries to the Eye from Metallic Foreign Bodies.

WEDNESDAY.—Dr. T. M. L. Squire: Diseases of the Eye and the Workmen's Compensation Act.

MIDDLESEX HOSPITAL MEDICAL SCHOOL (UNIVERSITY OF LONDON).

FRIDAY, June 3rd.—3 P.M., Dr. C. H. Bond: Psychiatry.

QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, E.

A Course of Post-Graduate Clinical Lectures and Demonstrations in the Board Room of the Hospital, free to Medical Practitioners and Students of Medicine.

MONDAY, May 30th.—4 P.M., Mr. N. C. Lake: Juxta-Epiphyseal Strain and its Sequelæ.

TUESDAY.—4.30 P.M., Dr. E. Pritchard: The Dietetic Treatment of Wasting Babies.

THURSDAY.—4 P.M., Dr. P. Parkinson: Demonstration of Heart and Lung Cases in the Wards.

FRIDAY.—2.30 P.M., Mr. J. Taylor: Surgical Tuberculosis other than that of Bones and Joints.

TAVISTOCK CLINIC FOR FUNCTIONAL NERVE CASES, 51, Tavistock-square, W.C.

A Course of Ten Lectures on Elementary Psychotherapy, to be given by Dr. H. C. Miller, at the Kingsway Hall, Kingsway, W.C.

FRIDAY, June 3rd.—5.15 P.M., Lecture V.:—Emotional Development; The Child and the Adult; Sex Characteristics; Adaptation.

INSTITUTE OF PATHOLOGY AND RESEARCH, St. Mary's Hospital, in the Lecture-room of the Bacteriological Department.

A Course of Lectures on Pathological Research in its Relation to Medicine, open to all Members of the Profession and Students.

THURSDAY, June 2nd.—4.30 P.M., Prof. G. Dreyer: A New Departure in the Serum Diagnosis of Syphilis.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE CLINIC.

TUESDAY, May 31st.—4.30 P.M., Lecture:—Sir William Milligan: Endoscopic Examination of the Food and Air Passages.

MANCHESTER FRENCH HOSPITAL POST-GRADUATE LECTURES, 24, Acomb-street, Whitworth Park.

Special Course of Lectures in Gynæcology.

WEDNESDAY, June 1st.—11 A.M., Demonstration Operations.

THURSDAY.—4.30 P.M., Lecture VIII.:—Dr. A. C. Magian: Pelvic Peritonitis.

Appointments.

DICKSON, K., M.B., B.Ch. Cantab., M.R.C.S., L.R.C.P. Lond., Clinical Assistant to the Hospital for Sick Children, Great Ormond-street.

GOTHE, WERNER, M.R.C.S., L.R.C.P., Head of the Massage and Medical Gymnastics Department at Queen Mary's Hospital for the East End.

KENNON, R., M.D. Liverp., F.R.C.S. Eng., Honorary Assistant Surgeon to the Royal Infirmary, Liverpool.

MORRISON, M., M.B., Ch.B. Edin., D.T.M. Eng., Medical Officer, West African Medical Staff, Nigeria.

REYNOLDS, R. J., M.B., B.S. Lond., Adviser in Radiology to the Ministry of Pensions and Physician in Charge of the Department of Radiology and Electro-Therapeutics at Charing Cross Hospital.

STOCKS, P., M.D. Camb., Medical Officer in connexion with the Department of Applied Statistics and Eugenics in the University of London.

TIMBRELL FISHER, A. G., F.R.C.S., Eng., Surgeon with charge of Out-Patients at the Dreadnought Hospital, Greenwich, in succession to E. T. C. Milligan, F.R.C.S. Eng., who has been promoted to the Senior Staff.

YOUNG, W. A., M.R.C.S., L.R.C.P. Lond., Pathologist to St. John's Hospital for Diseases of the Skin.

Jessop Hospital for Women, Sheffield: KING, W. W., F.R.C.S. Edin., Honorary Surgeon: STACEY, J. E., M.B., Ch.B. Sheffield, Registrar.

Vacancies.

For further information refer to the advertisement columns.

Ashton-under-Lyne District Infirmary.—Res. Surg. O. £250.

Adelaide University.—Professor of Zoology. £1100.

Bedford County Hospital.—Asst. H.S. £150.

Bethlem Royal Hospital, Lambeth-road, S.E.—Jun. Asst. Phys. £350.

Birmingham General Hospital.—H.S. £100. H.S.'s to Special Depts. £125 each.

Birmingham, Queen's Hospital.—Hon. Obst. Officer. Surg. Registrar. £100.

Birmingham University.—Demonstrator of Anatomy. £300.

Bradford Royal Infirmary.—H.S. £200.

Buxton, Derbyshire, Devonshire Hospital.—H.P. £250.

Cardiff, King Edward VII. Hospital.—H.S. £200.

Charing Cross Hospital, Agar-street, W.C.—Asst. Phys.

Chester Royal Infirmary.—Asst. H.S. £175. Also Hon. Asst. S.

City and County of Bristol.—Asst. Res. M.O. at Ham Green Isolation Hospital and Sanatorium. £300.

City of London Hospital for Diseases of the Chest, Victoria Park, E.—H.P. £125.

Colchester, Essex County Hospital.—H.S. £200.

Colchester, Severall's Mental Hospital.—Asst. M.O. 7 gs. per week.

Durham, County Sanatorium, Holywood Hall, Wolsingham.—Asst. M.O. £100.

Evelina Hospital for Children, Southwark, S.E.—Phys. to Out-patients.

Finsbury Dispensary, Brewer-street, Goswell-road, E.C.—Phys. £50.

Glasgow, Anderson College of Medicine.—Chair of Practice of Medicine.

Gloucester County Asylums.—Locum Tenens. £7 7s. weekly.

Hampstead General and North-West London Hospital, Haverstock Hill, N.W.—H.P. H.S. Each £150.

Harrogate Infirmary.—H.S. £150.

Hospital for Sick Children, Great Ormond-street, W.C.—H.S. £100.

Hull Royal Infirmary.—Asst. H.S. £150.

Lanarkshire Joint Committee on Venereal Diseases.—Ven. Dis. Officer. £750.

Leicester Royal Infirmary.—H.S. £200.

Leith Hospital.—Res. M.O. 50 gs.

Liverpool Royal Southern Hospital.—Two H.P.'s and three H.S.'s. Each £100.

Liverpool Stanley Hospital.—Three H.S.'s Each £120.

London Lock Hospital, 91, Dean-street, W.—Clin. Assts.

London Temperance Hospital, Hampstead-road, N.W.—Res. Cas. O. £125.

Maidstone, West Kent General Hospital.—H.S. £220.

Manchester, County Asylum, Prestwich.—Locum Tenens. £8 8s. per week.

Manchester University.—Lecturer in Morbid Anatomy and Morbid Histology. £700. Lecturer in Bacteriology. £700. Lecturer in Chemical Pathology. £700.

Miller General Hospital for South-East London, Greenwich-road, S.E.—Res. Cas. O. £150.

Newport, Royal Gwent Hospital.—Hon. Radiologist.

North Middlesex Hospital, N.—Anæsth. 75 gs.

Norwich, Norfolk and Norwich Hospital.—H.P. £200.

Oldham Royal Infirmary.—First and Second H.S.'s. £250.

Orkney, Eday Parish Council.—M.O. £5 per week.

Preston and County of Lancaster Royal Infirmary.—H.S. £200.

Prince of Wales's General Hospital, Tottenham, N.—Hon. P. and Hon. Asst. P.

Queen Mary's Hospital for East End, Stratford, E.—Cas. O.

Rotherham Hospital.—Jun. H.S. £150.

Royal Naval Medical Service.—Surg.-Lieuts. 26s. 6d. per diem.

Royal Waterloo Hospital for Children and Women.—Hon. Phys. for Out-patients.

St. Helens Hospital, Lancashire.—Res. M.O. £250.

Southampton Free Eye Hospital.—H.S. £200.

Southampton, Royal South Hants and Southampton Hospital.—Sen. H.S. £200. H.P. £150. Jun. H.S. £150.
South Uist, Parish of.—M.O. and Public Vaccinator. £170.
Staffordshire General Infirmary.—H.S. £250.
Stamford, Rutland and General Infirmary.—H.S. £250.
Sunderland Royal Infirmary.—H.S. £200.
Swansea County Borough.—Asst. M.O. £500.
Taunton and Somerset Hospital.—Sen. and Jun. H.S.'s £200 and £150.
Throat Hospital, Golden Square, W.—Hon. Registrar.
University College Hospital.—Part-time Anæsth. £150.
Wigan Education Committee.—Female Asst. Sch. M.O. £500.

THE Chief Inspector of Factories, Home Office, S.W., gives notice of vacancies for Certifying Surgeons under the Factory and Workshop Acts at Athlone, Brecon, and Sedgeley.

Births, Marriages, and Deaths.

BIRTHS.

REYNOLDS.—On May 17th, at Palmerston-place, Edinburgh, the wife of Dr. A. O. P. Reynolds, of a son.

MARRIAGES.

FOX—WALDING.—On May 20th, at Holy Trinity Church, Plymouth, Edward Lawrence Fox, M.D., M.R.C.P., to Elizabeth Clare Walding, youngest daughter of the late Thomas Walding and Mrs. Walding, of Harrow-on-the-Hill.

IRVINE—CARR.—On May 6th, at Nairobi, Dr. Archibald Clive Irvine, Church of Scotland Mission, Tumu Tumu, Kenya, to Margaret Joyce, eldest daughter of Mr. and Mrs. Ernest Carr, Woodlands, Nairobi, late of Wigton Hall, Cumberland.

LILEY—GOOZEE.—On January 11th, at the British Consulate, Tangier, Dr. James Liley, of the North Africa Mission Hospital, Tangier, to Edith, only child of the late Mr. and Mrs. Thomas Goozee, of New Malden, Surrey.

TATHAM—BARKER.—On May 19th, Arthur Leopold Tatham, M.B., B.C., to Ellinor Gertrude, widow of Brigadier-General Randle Barnett Barker, D.S.O.

TUCKER—GEDDES.—On May 12th, at St. Marylebone Church, Donald Leslie Tucker, B.A., M.R.C.S., L.R.C.P., to Margaret Gordon, only child of the late Brigadier-General J. G. Geddes, C.B., C.M.G., R.A., and Mrs. Geddes, of North Warnborough, Hants.

DEATHS.

CAMPBELL-HORSFALL.—On May 18th, Charles Edward Campbell Horsfall, M.B., Ch.B.

CREMONINI.—On May 20th, suddenly, at Penzance, John Cremonini, M.R.C.S., L.S.A., late Medical Superintendent Hoxton House Asylum and Government Asylum, Auckland, N.Z.

FERRIS.—On May 17th, at Warwick Dene, Ealing, John Spencer Ferris, M.B., aged 79 years.

WEST.—On May 19th, at St. George's-road, S.E., William Goldsborough West, M.D., M.R.C.S., L.R.C.P., aged 55 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

BOOKS RECEIVED.

ANGUS AND ROBERTSON, Sydney.
The American University: An Australian View. By Prof. E. R. Holme. Pp. 242. 7s. 6d.

MARLBOROUGH, E., AND Co., London.
Gujarati Self-Taught. By N. M. Dhruva. Pp. 113. 4s. 6d.

VOGEL, F. C. W., Leipzig.
Diagnostik und Therapie der Knochen und Gelenktuberkulose mit besonderer Berücksichtigung der Theorie und Praxis der Sonnenbehandlung. Von Dr. med. Eugen Kisch, mit einem Vorwort von Professor August Bier. Pp. 284. M. 140.

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THE AVAILABLE REMEDIES IN IMMUNE THERAPY.[1]

BY SIR THOMAS HORDER, M.D., F.R.C.P. LOND.

Specific and Non-specific Measures.

WHEN faced with a case of disease due to microbic infection we think of the employment of (1) measures for assisting the patient's general functions (nervous, circulatory, respiratory, digestive, and eliminative) during the extra strain put upon them, and (2) measures for helping the special function, or mechanism, of immunity against the particular infection. The treatment given under the first head is termed non-specific; under the second, specific.

I have recently urged the importance of non-specific measures in the treatment of many infective processes. The stimulus lately given to specific therapy by the advances made in bacteriology, and especially by the introduction and popularisation of bacterial vaccines, has led to a good deal of disregard of general measures of proved utility. It behoves us to be as prompt and thorough in maintaining a patient's general resistance to infection as in the use of any specific remedy which has experience or experiment, or both, to recommend it.

The Principles of Immune Therapy.

Let us first briefly re-state the basic principles underlying all attempts at immune therapy, without subscribing to any doctrine as to the exact nature of the immune process. In diseases of microbic origin the process is the expression of an interaction between the infecting agent and the body tissues. The immediate contributions to this interaction on the part of the micro-organism are the specific chemical poisons—*toxins*—incidental to the life of the microbe in the body. Toxins are of two kinds—exotoxins, produced in the medium in which the bacterium thrives, and endotoxins, those existing in the cell of the bacterial element itself, and set free only by the disintegration of the cell element. Microbic diseases fall into two groups, according as the poisons leading to the symptoms of the disease are chiefly exotoxins or are chiefly endotoxins. Of the first kind are tetanus and diphtheria; of the second, cholera, typhoid, and diseases due to the pyogenetic cocci (streptococcus, pneumococcus, &c.). But these two forms of toxin are not the only contributions made by the infecting agent to the interaction; there are the essential structural constituents of the bacterial cell itself, which, as soon as the cell is destroyed by the tissues of the host, become agents in the interaction.

So much for the contributions of the microbe. What are the contributions of the infected host? A protective substance termed generically *antibody* is formed in response to the stimulus of the various microbic factors already mentioned and which are generically called *antigen*. Knowledge of the various properties exercised by this hypothetical substance called antibody has led to the postulation that antibody comprises a number of different substances. If the exotoxin is neutralised we speak of antitoxin; if the endotoxin is neutralised, of anti-endotoxin; if bacteria are agglutinated, of agglutinin; if precipitated, of precipitin; if they are directly destroyed we call the specific substance, or the property of the antibody, bacteriolysin; if leucocytes are stimulated to phagocytosis, we speak of opsonin.

Experiments have shown that in the interaction an intermediary substance is necessary, without which antigen and antibody are unable to assume any very intimate chemical relations with each other. This third substance, which is present in healthy blood and tissue-fluids, is termed *complement*. Complement is certainly necessary for the neutralisation of toxin with antitoxin; to what extent, or if at all, it is essential for the complete interaction of other forms of antigen with corresponding forms of antibody we do not clearly know.

Now specific therapy has as its object the artificial increase of antibody. Incidentally, it has a secondary object—the maintenance of efficient complement. The artificial production of antibody may be attained in two very different ways: *passive immunity* may be conferred upon the patient with ready-made antibody, or *active immunity* may be produced by stimulation of the patient to manufacture his own antibody on a larger and more efficient scale than he is already doing. Immunised serum derived from animals (e.g., the horse) is most commonly used to confer passive immunity; active immunity is most commonly produced with bacterial vaccines. The two methods may be combined in certain diseases.

[1] Abstract of address delivered before Torquay Medical Society.

Available Means of Employing Specific Therapy.

(1) The use of immune serums: (*a*) Antitoxic serums, which chiefly act by the neutralisation of exotoxin formed by bacteria in the body; (*b*) bactericidal serums, which chiefly act by destruction of the bacteria, thereby preventing the increase of endotoxin.

(2) The use of bacterial vaccines, which serve to stimulate the natural mechanism of immunity.

(3) The use of immune serums and vaccines conjointly, either as separate remedies or in the form of sensitised vaccine.

(1) Antiserums: (*a*) Antitoxic serums remain the most strikingly successful, as they are historically the earliest, of all the remedies used in specific therapy, and this applies especially to antidiphtheria serum, less so to antitetanus serum, but the more limited success of the latter remedy is undoubtedly due to the difficulty entailed by the path of infection of the virus rather than to lack of potency in the serum.

(*b*) Bactericidal serums have never yet attained anything like the same degree of success as antitoxic serums, having hitherto lacked a sufficiently rich content of antibody to lead to any uniformly good results. Another difficulty in preparing these serums is connected with the fact that most of the bacteria against which they are manufactured exist in groups, and a serum prepared against one group is by no means specific in respect of antibody for another group. The attempt made in the case of streptococci to produce "multivalent" serum has not proved successful; more hope appears to lie along the line of producing univalent serums against the different groups.

(2) Bacterial vaccines are at present the chief type of immunising substance employed in combating nearly all infections by known micro-organisms possessing powerful endotoxins.

(*a*) The earliest form of vaccine remains the one in most common use—a simple suspension of the killed microbe in normal salt solution. Most bacteriologists appear to kill the bacterial elements by heat; some prefer autolysis—allowing the micro-organism to undergo auto-digestion in the warm incubator after counting. Others, believing that heat interferes with the efficacy of the vaccine, rely upon some such antiseptic as tri-cresol. If we knew exactly what are the initial processes going on in the human body when living microbes invade it, we should be better able to decide how best to prepare the cell-element before we inject it in the form of a vaccine. It seems reasonable to suppose that undue heat and the presence of chemical agents are both to be avoided if the tissue is to digest the bacterial cell and manufacture antibody of use against the living micro-organism.

(*b*) "Sensitised" vaccines ("sero-vaccines") are made by bringing a bacterial emulsion into contact with the appropriate immune serum (e.g., a *Streptococcus pyogenes* is mixed with a univalent *S. pyogenes* serum). The specific antibody in the serum becomes "fixed" by the bacteria, and the combination is termed a "sensitised vaccine." Some authorities doubt whether this sensitisation of vaccines adds to their therapeutic value, and this question is still unsettled.

(*c*) "Live" vaccine has been used by Alcock and others in some cases of gonococcus infection, and in one or two other infections. No special results appear to have been obtained—certainly none which counterbalance the obvious risks that might be run if such a system became generally adopted.

(*d*) "Phylacogens" are prepared with special effort to render the cell-body, which constitutes an essential part of the vaccine material, easily assimilated by the tissues into which it is injected. It is very pertinently argued that valuable time may be lost during the preliminary effort of the tissues to digest or disintegrate the bacterial cell element in order to start the specific interaction resulting in the formation of antibody. An endeavour is therefore made, "partly by appropriate temperatures and partly by chemical agency," to get the bacterial cell structure into solution. During this process there is inevitably added to the solution a certain amount of the exotoxin of the bacteria—an amount depending, no doubt, upon the nature of the medium; but as this medium is invariably fluid the amount of exotoxin cannot be negligible, and it perhaps accounts for the very sharp reaction sometimes seen after the use of this class of remedy. On general principles, as the object in view is not to add more exotoxin to the patient's burden, this must be regarded as a point against the method. To what extent the endotoxin of the bacterial cell goes into solution it is not possible to say, because unfortunately we have no chemical means of measuring this substance; but it seems fairly certain that in the preparation of phylacogens a more successful effort has been made in this direction than hitherto.

(*e*) The most modern of all remedies of the bacterial vaccine type are the detoxicated vaccines. These we owe to Dr. David Thomson, who argues that it is an advantage to get rid of the endotoxin of the bacterial cell, if that were possible, partly because of the known difficulty of producing anti-endotoxin experimentally by the injection of the whole cell element and partly because, with the endotoxin removed, it would be possible to use much larger doses of the vaccine, and thus obtain proportionately larger responses in the way of cell-destroying antibody. Thomson considers that he has devised a means of removing the endotoxin without, at the same time, altering the nature of the bacterial cell substance, which is then left for purposes of inoculation. As yet it is too early to judge of the value of these detoxicated vaccines.

Choice of Remedies.

The choice of the particular remedy to be employed in any case of infective disease depends upon (*a*) the nature of the infection, (*b*) whether it is local or general, (*c*) its acuteness or chronicity, and (*d*) the stage at which the infection has arrived. Let it be noted that there are two important differences between serums and vaccines arising out of their mode of action as already outlined: (1) Immune serums act rapidly, but their action is transient; vaccines act slowly, but their action is more prolonged; (2) immune serums supply important substances that are lacking in the body, and do not require much active response on the part of the tissues in order to produce their effects; vaccines depend for their action upon a latent power in the tissues of producing antibody when specifically stimulated to do so. It may be said that the more acute and generalised the disease-process and the more ill the patient, the more likely is immune serum to prove efficacious; the more chronic and localised the disease-process and the less ill the patient, the more likely is a suitable vaccine to do good. It is often advisable to begin the treatment of a severe case of infection by immediate and liberal use of an appropriate serum, and to follow up any advantage thus gained by inoculation with a vaccine prepared in the meantime.

Results and the Future.

The fact that so many remedies are available for inducing immunity stimulation in the patient proves how far we still are from standard measures of treatment and results showing any sort of uniformity. There are difficulties in connexion with immunity research; no subject calls for greater imagination combined with meticulous technique. There are difficulties in connexion with the practical use of the substances offered for exploitation to the practitioner. What argument can be more difficult or more complex than the therapeutic argument? It is full of pitfalls and possible fallacies. Patients get well at times in spite of our treatment, and they die at other times when the remedies seem to possess the hall-mark of precision. *Post hoc* and *propter hoc* dog us wherever we go, and properly to assess the part played by any remedy in the recovery of the patient is easy only to the ignorant.

It will not be surprising if some of the present clumsy technique is shortly superseded by more exact methods of preparation of immunising substances. The war, wasteful of time and brains as well as of human life and money, has no doubt delayed development; we must now exploit the remedies that are at our disposal as well as we can—not, by the way, adding to them in an amateurish fashion of our own.

We should understand what we are trying to do, and, so far as is possible, the nature of the materials with which we work. These principles of practice are not only essential to our own development, they are part of the duty which we owe to our patients. The preservation of mental clarity is a most important asset in the practitioner's attitude towards these things. Once he loses it he no longer controls his remedies: they control him.

MEDICAL AND SANITARY REFORMS IN MESOPOTAMIA.

A "Review of the Civil Administration of Mesopotamia," is the title of the paper recently presented to Parliament, giving an account of the civil administration during the British military occupation down to the summer of 1920, when, a mandate for Mesopotamia having been accepted by Great Britain, steps were being taken for the early establishment of an Arab Government. The preparation of the Report was entrusted by the Acting Civil Commissioner to Miss Gertrude Bell, C.B.E., Assistant Political Officer, Baghdad, who speaks Arabic fluently, is noted as a traveller and explorer in Asiatic Turkey, and has by her work and writings gained the Founder's Medal of the Royal Geographical Society. Subjoined is the substance of those portions of her report which relate to medical and sanitary matters:—

Closely connected, from one aspect, with the land—that is to say, with its capacity for production—is the provision of medical and sanitary facilities for the civil population. If man-power is the primary asset in the national economy of every community, in Mesopotamia the problems connected with its preservation and increase present themselves in an acute form. The vast development of which the country is capable waits upon a substantial addition to the number of its inhabitants. ..... The population of the 'Iraq, though scanty, is prolific, but the absence of medical

arrangements and an all-prevailing ignorance of the laws of health and sanitation have combined to keep it down. If infant mortality were arrested and the children given a better prospect of reaching adult life it might not improbably be doubled in the next 30 or 40 years.

Public Health during the Military Occupation and in the Transition to a Peace Footing.

From a military point of view care of public health and the sanitation of the towns were necessary precautions if the troops were to be kept free from disease. A civil dispensary was opened in Basrah immediately after the occupation, while the Deputy Military Governors took steps to secure the cleanliness of the town. A civil hospital was started in 1915 and additional dispensaries opened in 'Ashar. A civil surgeon superintended these establishments, and was put in charge of sanitary arrangements in Basrah, and an army medical officer controlled the sanitation of 'Ashar. The sanitation of the gaol and the health of prisoners received careful attention. Lunatics could not be provided for locally and were sent to India for treatment. The attendance at the dispensaries and hospitals was greater than had been expected. The people accepted inoculation and other precautions against plague, and were eager for vaccination. After the occupation of 'Amarah a hospital and dispensary were opened there under a British army doctor, and they proved as popular as in Basrah. Similarly at Nasiriyah the services of a military doctor were lent to the civil hospital and dispensary.

After giving credit for the zeal and tact of the medical officers and praising the Indian dispensaries and medical staff, the Report goes on to state that during 1916 there was a notable advance in the sanitation of the towns, and that infectious diseases were checked. At Sug, owing to shortage of medical staff regular work was not started till 1917. The absence of a dispensary was regarded by the inhabitants as a grievance, though under the Turkish regime no such institution would have been dreamed of. Apart from their special use the hospitals made a most valuable form of propaganda work.

During the process of demobilisation it was necessary to assure the continuance of adequate health and medical services when the military authorities could no longer give assistance. By the middle of 1918 there was a civilian hospital or dispensary in each military station of any importance with either a civilian surgeon in charge or a military officer who undertook civilian work in addition to his military duties with the help of an assistant, usually an Indian subassistant surgeon. Native and Turkish doctors were also employed wherever possible, though, generally speaking, their sphere of usefulness was limited by lack of training.

Coördination of Civil Institutions.

The civil institutions had not been coördinated, owing to the absence of any central organisation, but in August, 1918, this was remedied by the appointment of a Civil Deputy Assistant Director of Medical Services, who worked in the office of the Military Director of Medical Services and acted as a liaison officer. In February, 1919, he became administrative head of the civil medical department, and in March, with the more complete organisation of the health department, he was appointed Secretary for Health. There were then in existence some 50 civil hospitals and dispensaries, three-quarters of which were run by a civil staff, though in nine of these supervision was undertaken by military medical officers. Arrangements had been made with the base medical stores before the end of 1918 to maintain sufficient supplies to meet all the requirements of the civil medical service for the year 1919, and the nucleus of a civil medical depôt had been formed in Baghdad.

By arrangement with the Red Cross Society, which demobilised in March, 1919, this depôt had the first option on all the Red Cross stock in the country. As regards sanitary work, locally trained inspectors and gangs replaced sanitary sections in the towns in which they had been employed, and the care of public health began to pass everywhere into civil charge. It includes the inspection of prisons, markets, noxious trades, and slaughter-houses, the provision of chlorinated water, measures to ensure general cleanliness, and the destruction of rats, mosquitoes, and flies. The civil surgeon of a provincial town, who is also health officer, is overwhelmed with administrative work in addition to his medical work, and it is only by unceasing labour that he can accomplish his task. The devotion shown by the officers of the Medical Service, and their tact and skill in handling the native population, have been beyond praise.

Hospitals and their Staff.

Immediate steps were taken to enlist what medical personnel was available in Mesopotamia and to recruit at home such additional staff as was required, with the result that it has been possible to supply urgent needs. There are now hospitals in Baghdad, Basrah, and Mosul, nursing sisters tend the civil hospitals, and both Baghdad and Mosul have hospitals set apart for women and children. The women's hospital in Baghdad has an interesting history. It is lodged in an excellent building, which was in Turkish times the civil hospital of the town. A small staff of French nuns had been employed by the Ottoman Government as nurses; they had endeared themselves to the people, and their community had earned our lasting gratitude by the services they had rendered to British prisoners during the war. It was decided to ask the nuns to continue to serve in the hospital under the new arrangements, and employment was offered to an additional number of trained sisters who are being brought from France. To see these admirable women carrying on their work with every advantage that the British Medical Service can supply carries conviction that all is not wrong with the world.

In Basrah, where the house used as a civil hospital is not suitable, a new building will be erected out of funds subscribed voluntarily by the inhabitants in memory of General Maude. Nasiriyah also boasts a Maude Memorial Hospital. The British and French nursing sisters undertake the training of native girls, not only to serve in the hospitals, but also with the object of creating a body of trained nurses to work among the native population. The better-class women of Baghdad readily admit the need of trained midwives, for, as they observe, the existing midwives bring disease instead of combating it. ..... Depôts for medical stores have been instituted both at Basrah and at Baghdad, and in the latter place, besides the women's hospital, there is a civil hospital for men, an isolation hospital, an X ray institute taken over from the army, a dental institute, two dispensaries, a nursing home for officers and their wives, and a venereal hospital for women. The terrible scourge of venereal disease receives special attention at other centres.

Prevention of Infectious Diseases.

The prevention of infectious diseases is being dealt with effectually, perhaps, the most gratifying achievement having been the checking of an epidemic of plague in 1919 by a whole-hearted resort on the part of the local population, male and female, to inoculation with plague vaccine. Over 80,000 people were inoculated. A vaccine lymph depôt, started by the military authorities at 'Amarah, ensures a supply of calf vaccine throughout the occupied territories. In the Mosul Wilayat the most serious problem which confronts us is the universal presence in the hills of malaria of a violent type. The condition of the villages is deplorable: some, indeed, are reported to be uninhabitable. In most areas occupied or traversed by our troops careful malarial surveys by specialist officers have been made, and it is hoped soon to preserve these records by making them available in condensed printed form so that they be accessible to all concerned.

Danger of infectious disease is notably increased by the influx of pilgrims to the Shi'ah shrines. During the war the pilgrimage was necessarily intermitted; permission to renew it was given in 1919, and exceptionally large numbers availed themselves of it. An average of 7000 pilgrims a month passed through the frontier town of Khanigin. No attempt has been made to imitate the Turkish quarantine arrangements, which were as burdensome as they were inefficient, but careful measures are taken to ensure the cleanliness of Khanigin, and a dispensary for the treatment of pilgrims will be opened at railhead. In the holy towns the pilgrims entail much additional sanitary work, but the precautions which have been taken cannot yet be considered to suffice.

Quarantine for the Dead.

The Report concludes with some account of the measures taken by the Health Department for the prevention of infection by the dead. Bodies brought for burial to Karbala and Najaf are quarantined under regulations which have been drawn up by an international commission controlled through the International Quarantine Board, but the control of both corpse and pilgrim traffic are difficult and delicate matters. It is hoped that in the future the subject may receive consideration by a committee consisting of the various interests concerned—transport, political, and medical. Finally, the Report says:—

It may be said with assurance that in few directions has more rapid progress been made since the occupation than in the case of public health. In Baghdad, Basrah, and Mosul the increase in the number of beds is as notable as is the increased efficiency of the present hospitals compared with those that existed in Turkish times. But it is, perhaps, in the provinces that the greatest change has been effected. Provincial hospitals and dispensaries were rare under the Ottoman regime, and even where they were to be found they were of little value. At Nasiriyah, for example, the staff consisted of a single doctor, who frequently shut the dispensary and went away, leaving all work at a standstill. The Turks made no attempt to win the confidence of the tribesmen, and the bulk of the population was thus left without medical aid of any kind. In the villages sanitary precautions were non-existent and in the provincial towns they were grossly insufficient.

The efforts of political officers and civil surgeons have brought about improvements which are indeed remarkable.

SOCIETY FOR RELIEF OF WIDOWS AND ORPHANS OF MEDICAL MEN.

Sir Alfred Pearce Gould presided at the annual general meeting of this Society, held on May 18th, at 11, Chandos-street, London, W. The report for 1920 showed that during the year 11 new members had been elected and 6 lost owing to death and resignation. The Society consists at the present time of one honorary, 163 life, and 137 ordinary members, making a total of 301. The income from investments amounted to £1682 odd, £373 received from subscriptions and donations, and the working expenses were £299. During the year two widows came upon the funds and three died. The sum of £1584 was distributed among the annuitants, comprising 52 widows and 6 orphans. Membership of the Society, which is one of the richest of its kind in the United Kingdom, is open to any registered medical practitioner who at the time of his election is resident within a twenty-mile radius of Charing Cross. Relief is only granted to the necessitous widows and orphans of deceased members of three years' standing and of life members. At the present time the widow who has an income of not more than £100 a year receives a grant of £50 per annum, and each orphan, up to the age of 16, a grant of £13 per annum. In speaking to the report the acting treasurer drew attention to the fact that the working expenses were about 5 per cent. of the total income. The next election of members will be on July 6th.

G. Ll. J. asks for suggestions in treating a case of acute nephritis following Henoch's purpura in a boy of 13. The febrile period lasted six weeks and left the urine loaded with albumin, blood, and epithelial casts.